


INSTALLING OIL HEAT



OIL HEAT
FROM THE
ARCHITECT'S
POINT OF
VIEW



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ARCHITECT'S POINT OF VIEW
by
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*Grateful acknowledgment
is made to the
Structural Service Department of
the American Institute of Architects
and to the many architects
whose valuable suggestions
have made this
booklet possible.*

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THE EMBLEM OF THE OIL HEATING INSTITUTE

And What It Means

THE Oil Heating Institute was founded by leading manufacturers of oil heating equipment for the purpose of establishing the highest standards of design and heating service, and increasing the general knowledge of oil heating. The Institute carries on impartial research and educational work and serves as a central bureau of information on oil heat.

Definite standards are maintained in its qualifications for membership:

1. *Character and experience.*
2. *Financial vitality and responsibility.*
3. *An oil burner that has given satisfactory service over a minimum period of two years.*
4. *A minimum of 200 fully successful installations.*
5. *Listing as standard by Underwriters.*

The emblem of the Oil Heating Institute is the symbol of satisfactory service in oil heating. It is displayed only by dealers whose manufacturers are members of the Institute. It is your assurance of satisfactory oil heating service. Look for it in your dealers' windows. The Emblem protects you and will be protected on your behalf by the Oil Heating Institute.

INSTALLING OIL HEAT



PRACTICALLY every architect who designs residential, commercial and institutional buildings is finding on the part of some of his clients definite interest in the use of oil heat. The facts favoring the use of correctly designed oil burners are so obvious that it is unnecessary to repeat them in detail. The elimination of the undesirable problems of coal and ashes and the flexibility and durability of the oil burning system of heating with its easy control, definitely appeal wherever the problem of heating exists.

There are really three classes of architects for whom this book has been prepared:

1. Architects who have successfully experienced the use of domestic oil burners.
2. Architects whose experience with oil burners has been unfortunate either because incorrectly designed machines were selected or because of incorrect installations.
3. Architects who have been waiting for developments in this industry before specifying oil heat.

Architects who have specified oil burning equipment and have carefully selected properly designed types of burners have never been disappointed. Such architects have become powerful exponents of the use of oil burning apparatus and do not hesitate to recommend it to their clients.

To architects who have had unfortunate experiences with oil burners and to those who are watching developments in this industry before actually specifying such equipment, the Oil Heating Institute wishes to make a frank statement.

There have been failures of oil burning apparatus in the past just as there have been failures in the early stages of every new industry. From the architect's point of view, when such failures occurred, the disappointment of the client and of the architect was justified. An analysis of any case of this nature will invariably show that failure was due to faulty design or inefficient installation service. This is the primary reason for the formation of the Oil Heating Institute—to establish standards of design and dependability so that architects and owners will find complete satisfaction in the equipment manufactured by members of this Institute.

The last two or three years have brought about

a surprising advance in the design and dependability of automatic oil burners. It is a well-demonstrated fact today that in machines of good design, all objectionable features have been eliminated. By following the advice given in this book and by carefully considering the equipment illustrated and described at the close, the architect may feel a sense of security which he has lacked in the past. He may present this information to his clients and use it in his specifications, knowing that the oil burners described in this book have been scientifically developed, and that the organizations behind them have passed the pioneer stages and are now presenting the results of several years of experience and careful study.

The architect is not asked to give blind credence to statements of dependability and service. He is asked merely to give his intelligent consideration to the various factors which make up the requirements for well-designed oil burners and to study the information in these pages in order to form his own conclusions. It will be found that this book does not deal in superlatives or in unnecessary "sales talk." Facts are what the architect wants and facts are what he is given by the Oil Heating Institute.

The Oil Heating Institute and Its Service to Architects

The Oil Heating Institute is an organization of manufacturers of oil burning equipment formed for the express purpose of establishing well analyzed standards of design and service, and increasing the general knowledge of oil burning equipment. It is an unincorporated organization founded to carry on research and educational work in this field.

Definite standards are stipulated in its qualifications for membership:

1. Character and experience of management.
2. Financial vitality and responsibility.
3. An oil burner that has given satisfactory service over a minimum period of two years.
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The Oil Heating Institute serves as a central bureau of information where anyone may secure

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unbiased facts and non-commercial advice on oil heat or the use of oil fuel. Working with the Institute are international authorities on oil and oil combustion, and specialists in the design of oil heating equipment. It is thus in a position to render a service of peculiar value to architects who are faced with the problem of selecting and specifying oil heating equipment.

Advantages of Oil Heat

The use of fuel oil for heating purposes in various industrial processes established the fact that oil offered opportunities for precise control, either automatic or manual, that was invaluable and could not be obtained with solid fuels. The cleanliness, lack of waste, freedom from smoke and soot and the opportunities for applying automatic and semi-automatic control soon established the desirability of this fuel for commercial and institutional buildings and forecast a new standard of living for American homes.

The development of automatic domestic oil heating equipment rapidly followed, and the results secured have now firmly established fuel oil as a desirable and successful method of heating homes of all sizes. The advantages are obvious. Automatic control eliminates the burdensome labor to home owners in caring for their heating plant. It permits the maintenance of uniform temperature throughout the heating season. It eliminates the waste of fuel by stopping combustion when heat is unnecessary and by starting it again as required. It eliminates the ash and dust nuisance, resulting in cleaner homes or buildings and permitting the utilization of basement space for living and recreational purposes.

Relative Cost of Oil Heat

Whether oil fuel is more or less expensive than other fuels is governed by a number of factors which vary in almost every installation. There is no direct answer to the question, "Does Oil Cost More Than Coal or Other Fuels?" A brief review of the governing factors will make this point clear.

Fuels are rated in accordance with the heat units they contain. It has been established that one U. S. gallon of oil of the grade commonly used in automatic oil heating equipment contains about 140,000 B.t.u. A pound of coal contains from 10,000 B.t.u. for the poorer grades to 14,000 B.t.u. for the higher grades. Considering fuel costs

alone, the question of cost can be answered roughly by comparing the cost per B.t.u. of coal and oil in the community where the installation is to be made.

The table presented herewith is based upon studies of the U. S. Bureau of Standards. It will be of assistance in comparing costs where oil fuel is to be substituted for coal or gas and the amount of such fuel consumed in an average season is known.

For example, it is desired to know how much it will cost to heat with oil a house that required ten tons of coal for the season. It is assumed that the oil will cost 8c per gallon. The coal cost \$12.00 per ton—\$120.00 for the season. From this table it will be found that 1,340 gallons of oil will be the equivalent of ten tons of coal and this quantity at 8c equals \$108.20 for fuel—a saving of \$12.80 by the use of oil.

Cost Comparison per Season

Number of Tons of Coal Burned per Season	Number of Gallons of Oil Required		Number of Thousand cu. ft. of Manufactured Gas Required (550 B.t.u.)
	U. S. Gallon	Imperial	
5	670	555	134.0
6	804	666	160.8
7	938	777	197.6
8	1,072	888	223.4
9	1,206	999	250.2
10	1,340	1,110	277.0
11	1,474	1,221	303.8
12	1,608	1,332	330.6
13	1,742	1,443	357.4
14	1,876	1,554	384.2
15	2,010	1,665	411.0

This table is based upon the following values: Coal, 11,765 B.t.u. per U. S. lb. Oil, 141,000 B.t.u. per U. S. Gal., or 169,200 B.t.u. per Imperial Gal. Gas, 550 B.t.u. per cubic foot. The efficiencies used are the average obtained in practice. In the case of gas it is assumed that the boiler or furnace used is designed for gas. If the gas is applied to boiler or furnace designed for coal, the figures in the table should be multiplied by 1.14.

Many intangible values must also be considered. There is an important saving in labor by the automatically controlled oil heating apparatus. Thermostatic control means economy of fuel, for fuel is burned only when it is needed. Other factors which will be discussed later include the efficiency of the heating plant, its adaptability to the fuel employed and the manner in which oil heating

apparatus is installed, adjusted and operated. The price of coal covers delivery of bulk fuel to the coal bin. Before it becomes heat all of the familiar and objectionable intermediary steps must be gone through. Oil delivered to the storage tank remains untouched until it is transformed into clean, uniform heat.

Basic Requirements for Successful Installations

Architects specifying oil heating installations must appreciate that oil burners as well as other similar mechanical equipment for domestic uses must be intelligently selected and the installation correct in all details.

Modern oil burners are as mechanically perfect as modern engineering and science thus far can make them. Under proper care they will function correctly and require little attention beyond periodical oiling and occasional cleaning.

Oil burners constitute merely one important element in a heating system. They will not overcome the troubles of a faulty boiler or of incorrectly installed radiation except in so far as they may provide greater heat than the former fuel could supply. All heating installations should be designed with all of the parts in proper balance and relationship including the boiler, the chimney or stack, the distribution system and the radiation.

Where oil heating apparatus is installed in existing boilers, the architect must adapt the burner by selection and adjustment to meet existing conditions. Vast improvements have been made in domestic boiler and furnace design in recent years which have greatly increased their efficiency. The installation of an oil burner in a poorly designed boiler or furnace will naturally limit the efficiency with which the heat units in oil are employed. Where the architect has an opportunity to make a new installation, as in the case of a new home being constructed under his direction, he can select modern boilers or furnaces especially adapted to oil heating and thus secure considerably better results than can be obtained with the average old style equipment.

Obviously a correct installation by the dealer is of paramount importance. As much attention should be paid to this one factor as to any other, for upon it depends the successful operation of the equipment. Similarly, the subsequent service and maintenance of the equipment is a substantial part

of the problem, and the best results will be secured only when the owner is willing to place all maintenance and service problems in the hands of service men supplied by the selling organization.

Principles of Combustion in Oil Burners

The modern automatic oil burner is classified as a mechanical draft burner. This indicates that the burner is motor-driven and that the air for combustion is supplied by a fan or blower. Generally where a fan is used it is of sufficient capacity to supply the entire amount of air for combustion, when the burner is operating at its maximum capacity. Where a blower, either centrifugal or positive pressure, is used, only a portion of the air required is supplied under pressure, the balance being induced by the action of the air from the blower plus the natural draft from the chimney. The fan or blower produces a constant supply of air under varying draft conditions and maintains a uniform air supply sufficient for the best combustion condition. The fuel is prepared for combustion either by atomization or a combination of atomization and vaporization within the burner. There are several ways to atomize oil: under pressure through a small orifice, by compressed air; by centrifugal force from the edge of a rapidly rotating cup or disc, and other equally effective methods. Any of these methods will break the oil into fine particles and when applied intelligently will give satisfactory results.

There is another type of burner—the natural draft vaporizing type, which is sometimes incorrectly referred to as a gravity burner. This type of burner requires the use of a very high grade of fuel and is entirely dependent upon the draft from the chimney for its air supply. Chimney draft is variable by reason of outside temperature changes, atmospheric conditions and wind currents. The result is a variable air supply which is responsible for a non-uniform and inefficient performance. While this type of burner does, under some conditions, give a reasonably satisfactory service, it cannot be recommended for general use because of its uncertain performance.

FUEL OILS: The uniform fuel oil specifications of the American Oil Burner Association classify fuel oils by numbers ranging from one to six. Oil No. 1 is a furnace oil—light (36°—45°)**. Oil No. 2 is called furnace oil—medium (32°—36°)**. Oil No. 3 is a furnace oil—heavy (28°—32°)**.

**Approximate Gravity Range

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These three oils are commonly used for domestic burner installations as they do not require pre-heating.

Oils Nos. 4, 5 and 6 are called fuel oil—light, medium and heavy, respectively, and range from 24 gravity to 12 gravity and heavier. They require heating because of their high viscosity at normal temperatures and are used only in large commercial and industrial installations.

Furnace oils Nos. 1 to 3 are generally used for installations requiring up to 15 gallons per hour or more in districts where heavy oil is not available. The fuel oils are used on larger installations where the heavier grades are available and where manual operation is desirable. This situation occurs in most industrial and commercial installations and in larger apartment houses and hotels where a janitor or mechanic is on hand at all times to make the necessary adjustments and to start and stop the burners. The fuel oils are less expensive than furnace oils, but the installation of heating equipment in the tanks and near the burners adds to the initial cost. The fact that they are not susceptible to fully automatic control eliminates the fuel oils from the domestic field.

The following Table gives the approximate cost (based on general averages) of grades of oil:

Furnace Oils	Fuel Oils
No. 1—9 to 10½c.	No. 4—7 to 7½c.
No. 2—8 to 10c.	No. 5—6 to 6½c.
No. 3—7 to 8½c.	No. 6—5 to 6c.

These various grades of oils are not uniformly distributed throughout the country. The architect must be careful to specify equipment which will handle the grades of oil available where the burner is to be installed. An examination of the pages in the second part of this booklet will show the various oils recommended by the burner manufacturers. Owners should be advised to employ only the grade of fuel for which the burner is designed, except that a lighter grade than the one specified can be used in any type of burner.

Boilers, Furnaces and Chimneys as They Affect the Selection of Oil Burners

The types of burners above described produce flames of various sizes and shapes which are directed into the combustion chamber or originate therein in various positions. Where existing boilers are to be equipped with oil heaters, the

shape and size of the combustion chamber and the length of flame travel within the boiler or furnace should be taken into consideration in selecting appropriate equipment.

Where a completely new installation is being made, the architect should specify a boiler which is efficiently designed for oil heating installation. In general, water tube boilers are more efficient and should have preference.

Warm air furnaces should preferably be of welded steel construction to insure gas-tight combustion chambers. Thus is eliminated any possibility of combustion gases leaking through into the air heating compartment.

Furnaces of cast-iron construction may be just as efficient as the welded steel, but they require more attention. In either case, the design should provide for extended flame travel for efficient operation and to keep the stack temperatures moderately low.

Chimney flues and stacks for oil burner installations should be of the size specified by the boiler manufacturer. The excess draft is readily controlled by means of dampers, but an inadequate draft will prevent the correct operation of the burner.

Oil burners should be selected which have a capacity equal to 100% of the correct boiler or furnace rating and they should be adjustable to from 50% to 100% of that rating.

FUEL STORAGE AND DELIVERY—Fuel may be stored either in underground tanks outside the walls of the building or in side tanks. Local ordinances usually specify the requirements for tank location. While smaller tanks require more frequent filling, they are thoroughly practical for small homes where oil deliveries can be made regularly. All fuel oil tanks should be equipped with oil level indicators which will record inside the building the quantity of fuel remaining in the tank.

In selecting oil burning equipment, it is desirable that the architect provide storage tanks of ample size to obtain the lowest prices for oil and to provide a reserve adequate to take care of possible delays in delivery.

AUXILIARY SERVICES REQUIRED—The automatic operation of domestic oil burners depends upon control mechanisms which will shut off the burner and ignite the flame again as required. Ignition of the oil fuel may be accomplished by a gas pilot, an electric spark, a combination of

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electricity and gas, or occasionally by means of an oil torch. In specifying oil heating equipment, architects should choose apparatus having ignition equipment suited to local conditions.

SAFETY DEVICES AND AUTOMATIC CONTROL—The successful operation of thermostatic devices depends in a very large measure upon the correct location of the thermostatic switch. It must be placed in such a position within the house as to secure a uniform temperature throughout the dwelling under average conditions. Naturally its location must be free from drafts or excessive heat or cold and approximately at the breathing level—about five feet from the floor. Dependence must be placed upon the correct disposition of radiation to take care of differences in room sizes and exposures.

Probably the most interesting and valuable feature that has been developed in conjunction with domestic oil heating apparatus is the ingenuity and reliability of the safety mechanisms. These vary to such an extent that a detailed description here is impracticable. All types function to give one or more and sometimes all of the following forms of control:

1. Should the ignition mechanism fail to operate when the oil and air supply is initiated, the apparatus will be automatically stopped.
2. Should the air supply fail, the oil supply will be automatically stopped.
3. Should the temperature within the boiler or furnace exceed a safe maximum due either to the lack of water in the boiler or to the failure of the thermostatic control to stop the mechanism when a normal temperature has been reached, the safety devices will effectively cut off the entire mechanism.

Some of these safety devices provide for re-starting as soon as the service is restored and conditions are again correct, in the heater in which the electric current operating the motor and ignition mechanism has been cut off through a breakdown in service. Other types simply stop the equipment and require the attention of the householder before they can be put into operation again.

INSTALLATION, ADJUSTING AND TESTING—The cost of oil heating equipment represents the burner and its control apparatus, the fuel tank and its connections and the installation. The burner itself represents about one-third of the total cost; the tank, tank connections and installation

represents about two-thirds of the total cost, and this equipment and the labor employed are seldom directly under the control of the oil burner manufacturer. Hence, in selecting and installing heating equipment, at least as much emphasis must be placed upon the experience, integrity, financial responsibility and skill of the organization making the installation as upon the reliability of the burner itself and the standing of its manufacturer. Many of the difficulties that were experienced in early installations, and that have to a certain extent retarded the acceptance of the oil heating by architects, may be traced directly to incorrect installations made by irresponsible or untrained dealers. Within recent years this situation has been largely corrected through the insistence of oil burner manufacturers upon the reliability of the organizations distributing and installing their machines.

Certain tests have been devised to determine the proper setting of an oil burner in a given installation. These include measuring flue temperatures and sometimes an analysis of the products of combustion. No constants can be developed, however, to represent ideal operating conditions for the reason that boilers themselves vary greatly in their capacity to transfer heat, and in some cases flue temperatures will necessarily be higher than others, due to the losses which may be blamed only upon the boiler. Tests, however, will develop the best operating conditions for any given installation.

SPECIFICATIONS COVERING INSTALLATION, ADJUSTING AND TESTING—In selecting oil heating equipment, architects should consider not only the merits of the equipment itself, but the qualifications of the dealer making the installation.

1. Be sure the dealer is financially responsible and likely to remain in business for an indefinite period.
2. Ascertain through investigation of previous installations that the dealer is competent to make a correct installation and to guarantee his work.
3. Investigate the service rendered by the dealer's maintenance force and take into consideration the distances from the dealer's headquarters to the installation.

Where possible, the architect should develop an agreement with his client to have a periodical maintenance service or an annual service contract which will provide that all care required by the

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heating apparatus for at least one year be supplied by the installing organization. This may be incorporated in the architect's specifications.

ARCHITECTS' COUNSEL TO CLIENTS—A proper appreciation by the home and building owner of the nature of his oil heating equipment, its capabilities and limitations, and the care it will require, will do more than anything else to assure satisfying results, once a correct installation has been made. The essential points for the client are summarized here:

1. Oil heating equipment functions only to provide heat. It will not take care of the water level in the boiler. It will not operate when the current is shut off, nor when the fuel is exhausted. The entire plant should have regular inspection to see that these conditions are correct.
2. Oil burners are machines requiring reasonable care, oiling of moving parts and occasional cleaning. In this respect they are like clocks, automobiles, fans and electric refrigerators.
3. Oil burners are subject to adjustment like all other machines, and operate best when perfectly adjusted. Expert service men can make the occasional adjustments far better than a layman or ordinary mechanic.
4. Once the correct adjustments are made, they can be disturbed only by the following methods:

- (a) Manually, as when someone attempts to interfere with the automatic operation of the burner, or to adjust the parts. Leave the apparatus alone, except for regular inspection, oiling and cleaning.
- (b) By changes in fuel. Stick to the same grade and quality of fuel, or have a service man readjust the burner when changes are necessary.
- (c) By presence of foreign matter—particularly in the fuel.
- (d) By natural wear. Periodic inspections will take care of these changes.
- (e) Automatic operation does not permit neglect. Give to your heating apparatus the reasonable care and attention any mechanical equipment requires.

These reasonable suggestions, if followed, will assure the maximum benefits and lowest operating costs to the owner. Correct equipment, properly installed and serviced, will be wholly free from smoke, odors, flare-backs and noise. Architects who will utilize the resources of the Oil Heating Institute and devote sufficient attention to the proper understanding and selection of oil heating equipment, can assure their clients an unsurpassed degree of satisfaction, health, comfort and convenience.

DESCRIPTIONS
AND
ILLUSTRATIONS

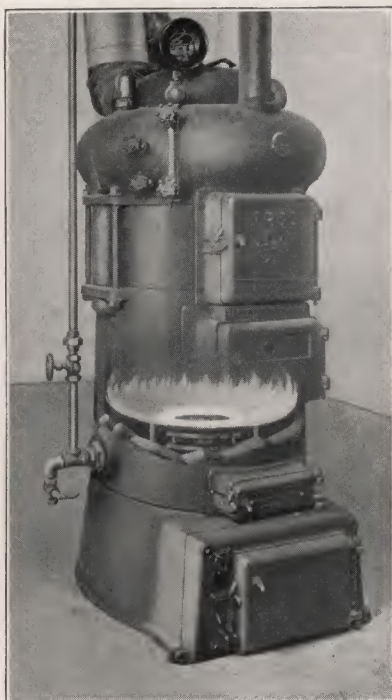
of the Oil Heating Equipment made by
Manufacturers who are Members of
the Oil Heating Institute



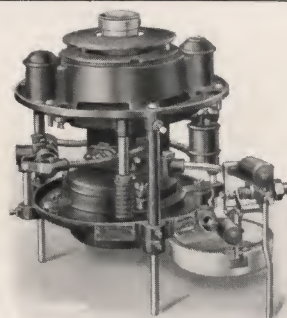
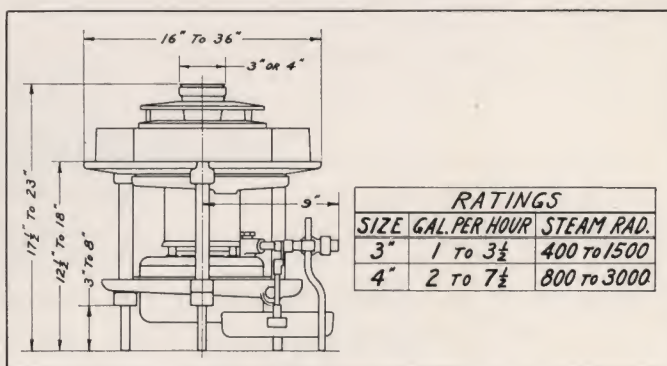
THE following pages describe and illustrate the oil heating equipment made by manufacturers who have made possible, through the Oil Heating Institute, the publication of this book. Only these manufacturers and their dealers are privileged to display the Emblem of the Oil Heating Institute.

If you desire more information about any of the oil heating equipment briefly described here, you are invited to write to the manufacturer. Mentioning that you were directed to them by the Oil Heating Institute will insure promptness and thoroughness in answering your inquiry.





ABC Automatic Burner Installed



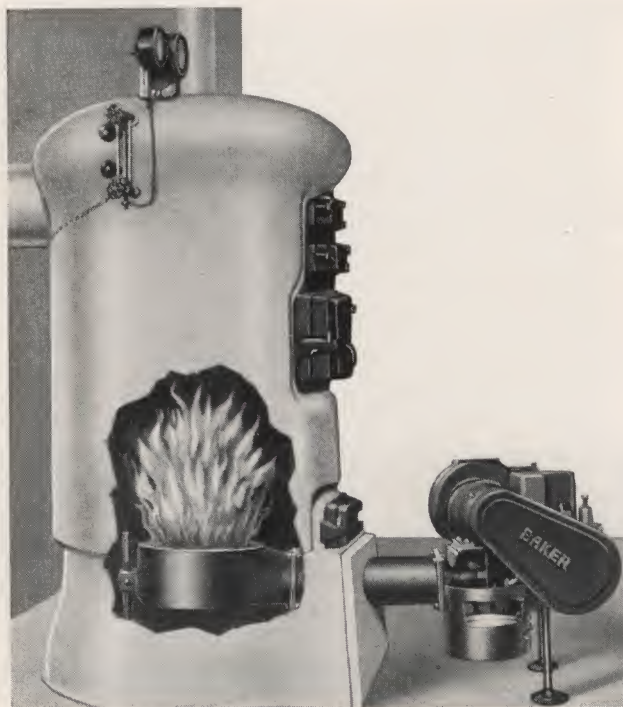
ABC Automatic Burner

ABC Automatic Burners are installed in all types of heating plants.

- | | | | | | | | | | | |
|--|--|-------------------|---------------|-------------------|-------|-----------|-----------|-------|-----------|-------------|
| <p>(1) Fully automatic.</p> <p>(2) Listed to burn 28-30 gravity oil (A.O.B.A. Spec. #3) and 25 gravity Pacific Coast Diesel Oil.</p> <p>(3) Oil is delivered either automatically from a buried storage tank or by natural flow from a basement tank.</p> <p>(4) The oil is atomized mechanically by being taken with the required amount of air into a spinning atomizing cup.</p> <p>(5) Furnished with either electric, combination gas and electric, or straight gas ignition.</p> | <p>(6) The flame is adjusted to the size of the boiler and the amount of radiation.</p> <p>(7) ABC is installed in any type of boiler or furnace. A refractory combustion bowl, replacing the grate, is the only change necessary.</p> <p>(8) Capacity in radiation.</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Size</td> <td style="text-align: center;">Sq. Ft. Steam</td> <td style="text-align: center;">Sq. Ft. Hot Water</td> </tr> <tr> <td style="text-align: center;">No. 3</td> <td style="text-align: center;">400-1,500</td> <td style="text-align: center;">640-2,400</td> </tr> <tr> <td style="text-align: center;">No. 4</td> <td style="text-align: center;">800-3,000</td> <td style="text-align: center;">1,280-4,800</td> </tr> </table> <p>(9) Motor sizes:
(Universal Motor)</p> <p style="margin-left: 40px;">No. 3—1/20 H.P.</p> <p style="margin-left: 40px;">No. 4—1/20 H.P.</p> | Size | Sq. Ft. Steam | Sq. Ft. Hot Water | No. 3 | 400-1,500 | 640-2,400 | No. 4 | 800-3,000 | 1,280-4,800 |
| Size | Sq. Ft. Steam | Sq. Ft. Hot Water | | | | | | | | |
| No. 3 | 400-1,500 | 640-2,400 | | | | | | | | |
| No. 4 | 800-3,000 | 1,280-4,800 | | | | | | | | |

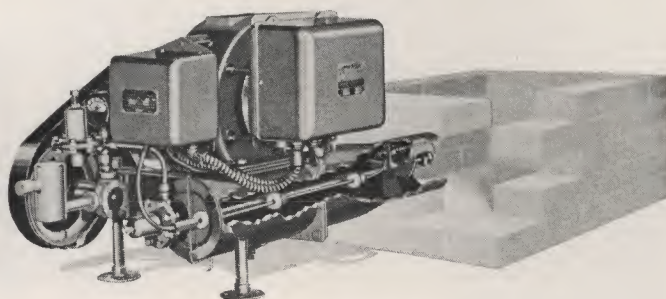
AUTOMATIC BURNER CORPORATION

312 North May Street - - - Chicago, Illinois



Model M Baker Oil Burner Installed

SIZE	A	B	C MIN.	D	E MIN.	POT O.D.	MOTOR	GALLONS PER HOUR	
								MINIMUM	MAXIMUM
G-10	15	9	21	50	10	13	1/4 HP	1.40	2.75
G-20	15	9	21	59	10	17	1/4 HP	3.00	5.25
G-30	15	9	21	59	10	17	1/2 HP	5.50	13.00
L-50	15	9	18	35	7	—	1/4 HP	2.00	5.25
L-60	15	9	18	35	7	—	1/2 HP	7.00	17.00



Model L Baker Oil Burner

Model "M" Baker Burners are self-contained units with metal inner and outer pots with a preheated contra-flow of air against the atomized oil. Suitable for residential, apartment house or small industrial plants.

Model "L" Burners are used with refractory pots and are suitable for installations in residences, apartments and industrial plants.

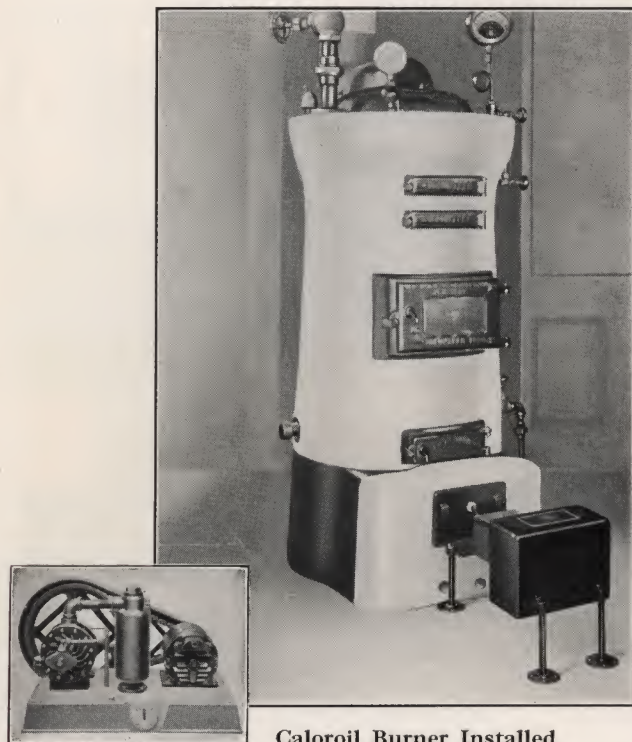
- (1) Both models mechanical draft A.C. or D.C. motor-driven burners. Both models fully automatic for either residential or commercial purposes.
- (2) Model "M" burners are listed to burn oil of 32 gravity (A. O. B. A. Spec. #2) or lighter or 27 gravity Pacific Coast oil. Model "L" burners are for oils of 28 gravity (A. O. B. A. Spec. #3) or lighter and for 25 gravity Pacific Coast oils.
- (3) With either model oil is drawn from storage tank by pump.
- (4) Atomization of oil is accomplished through the use of atomizing nozzle under pressure from pump.
- (5) Ignition system is fully automatic with transformer and electric spark.
- (6) Both oil pressure and air volume are varied to meet the requirements of the boiler or furnace.
- (7) Model "M" burners are installed in present heating systems, requiring only the removal of the grates. Model "L" burners require the removal of grates and building fire pot of refractory material.
- (8) Model "M" burners are built in three sizes: No. 10 burner ranging up to 960 feet steam radiation; No. 20 burner 1,000 to 1,800 feet steam radiation; No. 30 burner 1,900 to 4,500. Model "L" burners: No. 50 burner up to 1,800 feet steam radiation according to nozzle equipment; No. 60 burner 1,900 to 6,000 feet steam radiation.
- (9) Motor sizes:

Model M-10	1/4 H.P.
" M-20	1/4 H.P.
" M-30	1/2 H.P.
" L-50	1/4 H.P.
" L-60	1/2 H.P.

BAKER STEAM MOTOR CAR & MFG. CO.

Pueblo

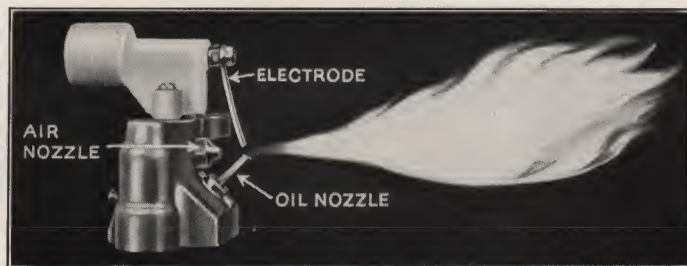
Colorado



Caloroil Burner Installed

FRONT OF BOILER					
		19"		11 1/2"	
MODEL-O	NO. OF	MAX. OIL PER HOUR	CAST IRON BOILER RATINGS	H. P.	
SERIES-5	NOZZLES	5 LBS. AIR PRESSURE	STEAM	HOT WATER	MOTOR
NO. 1	1	3 GALS.	1,250 *	2,000 *	1/4
NO. 2	2	6 GALS.	2,500	4,000	1/4
NO. 3	3	9 GALS.	3,750	6,000	1/2
NO. 4	4	12 GALS.	5,000	8,000	1/2
NO. 5	5	15 GALS.	6,250	10,000	1/2

* MINIMUM OIL PER HOUR FOR NO. 1 BURNER IS ONE GALLON
 NOTE: HIGHER AIR OR STEAM PRESSURES ARE USED FOR COMMERCIAL AND INDUSTRIAL WORK



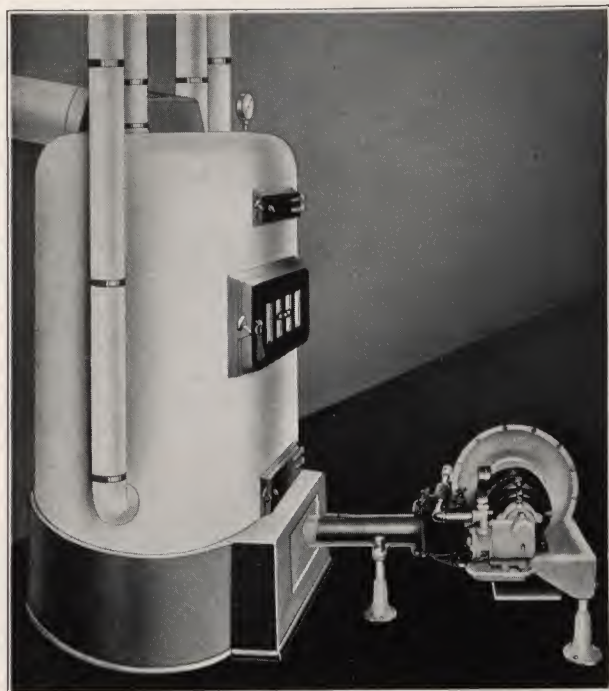
Caloroil Burner

Caloroil Burners are adaptable to any type of boiler or furnace. Air or steam, as the requirements demand, is used as the atomizing medium.

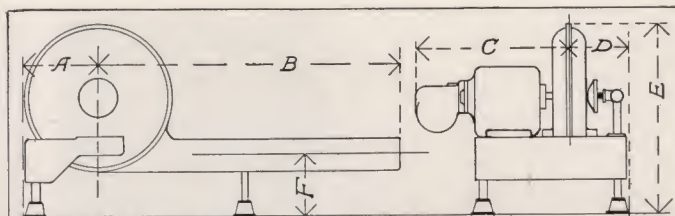
- (1) Caloroil is built in two units, the motor and compressor unit and the atomizing unit. It is of the forced draft type, using 5 pounds maximum air pressure for domestic installations and higher air or steam pressures for commercial and industrial work. Forced draft—equipped for A.C. or D.C. current.
- (2) Caloroil is listed to burn 28 gravity fuel oil (A.O.B.A. Spec. #3) or lighter.
- (3) Oil automatically fed to atomizing unit and then by vacuum to the combustion chamber.
- (4) Atomization of the oil is by the vacuum-pressure principle.
- (5) Caloroil is equipped with electric, electric-gas or straight gas pilot, as desired.
- (6) Oil and air for atomization controlled and easily regulated to produce flame suitable to each individual boiler.
- (7) Caloroil Burners are installed in any boiler by removing the grates and lining the ash pit (below water legs) with refractory material.
- (8) The Caloroil Burner is made in five sizes, as shown in the above chart. Due to the construction of the atomizing unit and the nozzles, complete distribution of the flame over the heating surface of the boiler is accomplished, as any number of nozzles can be used to suit the requirements.
- (9) Motor sizes:
 Numbers 1 and 2 1/4 H.P.
 Numbers 3, 4 and 5 1/2 H.P.

CALOROIL BURNER CORPORATION

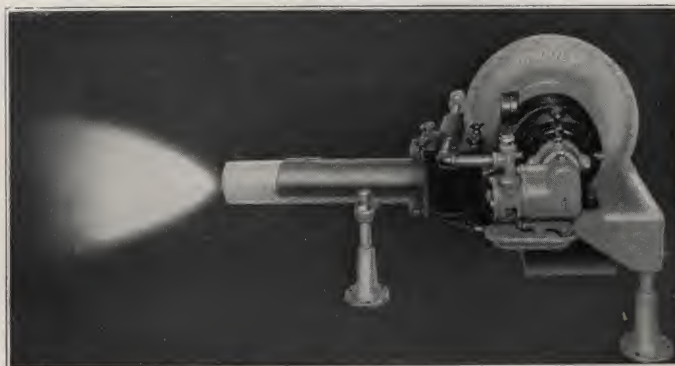
225 West 34th Street . . . New York, N. Y.



Chalmers Burner Installed



Chalmers Oil Burner Co. Model No. 7-1-28						E		F		Gal. Per Hour	
Model	A	B	C	D	H.P.	Min.	Max.	Min.	Max.	Min.	Max.
C-1	8	26	15	7	1/4	19	Order	6 1/2	Order	1	3
C-2	8	26	15	7	1/3	19	Order	6 1/2	Order	2	8



Chalmers Burner

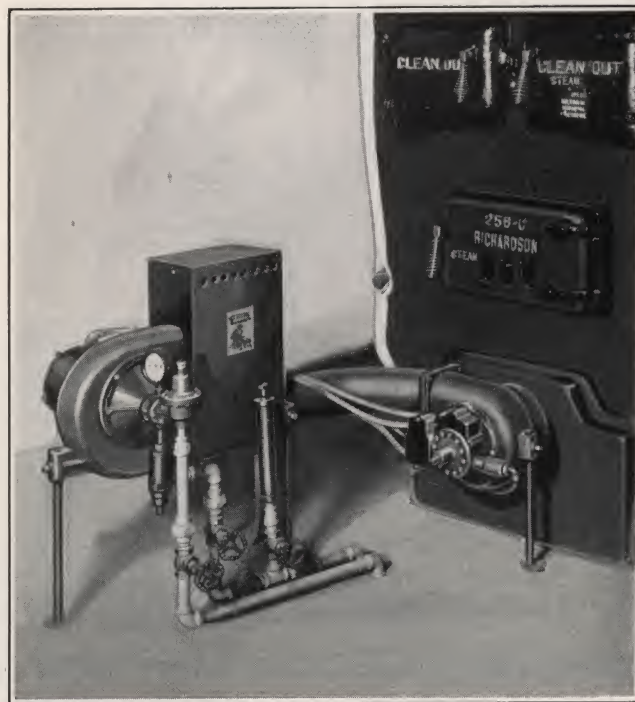
The Chalmers Oil Burner is a fully automatic burner designed primarily for steam, vapor, hot-water and warm-air domestic heating systems.

- (1) Mechanical draft. A.C. 110 or 220 volt motor. Full automatic control system, or manual control where needed.
- (2) Chalmers Burners burn 28 gravity oil (A.O.B.A. Spec. #3) or lighter.
- (3) Oil pumped from tank and to atomizing nozzle by rotary pump. Tank can be placed where most convenient.
- (4) Oil atomized by high pressure nozzle.
- (5) Ignition is automatic by electric spark.
- (6) Angle and volume of oil spray adjustable according to size of nozzle and oil pressure. 1 to 6 gallons per hour.
- (7) Grates and ash pit door removed to admit burner. Combustion chamber lined with fire brick.
- (8) Chalmers line of domestic burners includes also Type 3B, which has gas ignition, is listed to burn 32 gravity oil or lighter, (A.O.B.A. Spec. #2) and requires no brickwork in boiler.
- (9) Motor sizes:

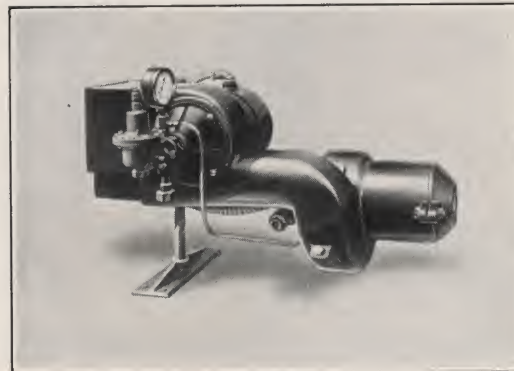
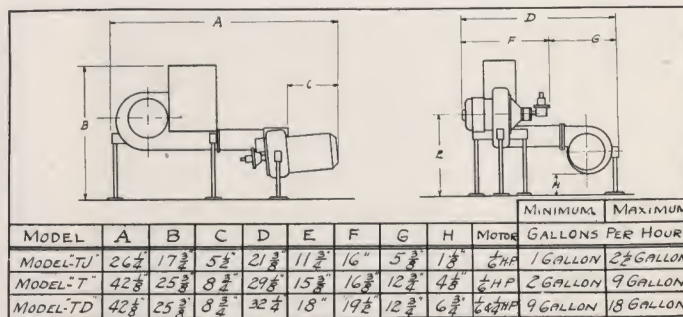
Model C-1	1/4 H. P.
" C-2	1/3 H. P.
" 3-B	1/6 H. P.

CHALMERS OIL BURNER CO.

1234 Central Avenue, N. E. . . . Minneapolis, Minnesota



Electrol Burner Installed



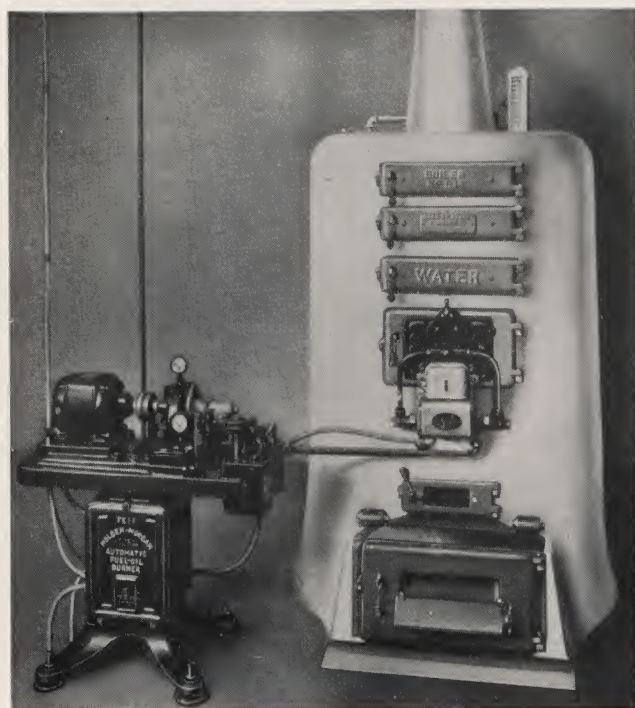
Electrol Burner

Electrol is all-electric and fully automatic, combining mechanical fuel atomization and automatic electric ignition. Suitable for domestic installation in homes of all types or for commercial installations in apartment buildings, churches, libraries, theatres, schools, banks, small office buildings, stores, bakeries, greenhouses and many other types of buildings.

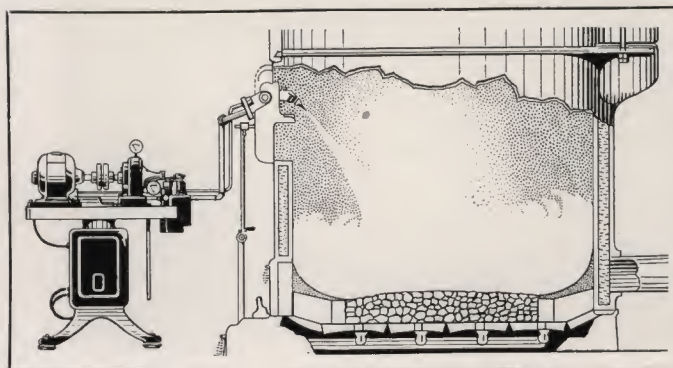
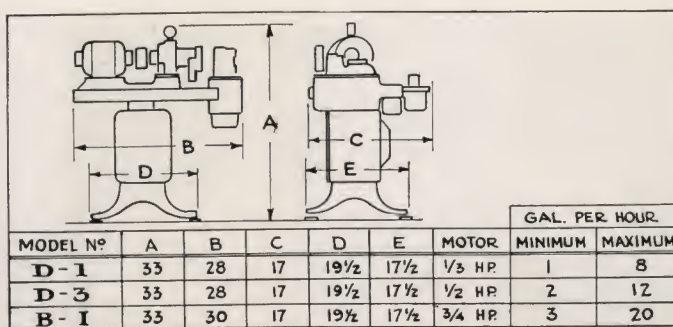
- (1) Mechanical draft, motor driven fully automatic, with electric Master Control, built as a unit with the burner.
- (2) Listed to burn oil fuel not heavier than 28 gravity (A.O.B.A. Spec. #3), also Diesel oil (Pacific Coast) not heavier than 25 degrees Baume when viscosity is not more than 54 seconds (Saybolt-Universal at 100 degrees F.)
- (3) Oil delivery is accomplished by one pump directly connected to the motor shaft, which serves the double purpose of pumping oil from supply tank and maintaining the proper pressure for combustion.
- (4) Mechanical atomization is employed. This is accomplished by forcing the oil under pressure through a specially designed nozzle.
- (5) The atomized oil is automatically mixed with the correct amount of air for proper combustion and ignited automatically and entirely with electricity.
- (6) Flame adjustments are made at the time of installation to meet the requirements of the boiler or furnace.
- (7) Electrol automatic burners are installed in the present heating system, requiring only the removal of the coal burning grates and the lining of the combustion chamber with refractory material.
- (8) Electrol automatic burners are manufactured in three sizes. The Junior burner, the Model TJ, has a range from 200 to 800 square feet of steam radiation, including piping and risers, or equivalent. Model T, from 600 to 3,000 square feet of steam radiation. Model TD, from 2,000 to 8,000 square feet of steam radiation.
- (9) Motor sizes:
 - Model TJ — 1/6 H.P.
 - " T — 1/6 H.P.
 - " TD — 1/6 and 1/4 H.P.

ELECTROL INC., OF MISSOURI

173 Dorcas Street - - - St. Louis, Mo.



Fess Holden Morgan Burner Installed



Fess Holden Morgan Burner

The Fess Holden Morgan is a low-pressure air atomizing, jet type burner. Fully electric and automatic, and suitable for domestic or commercial installations.

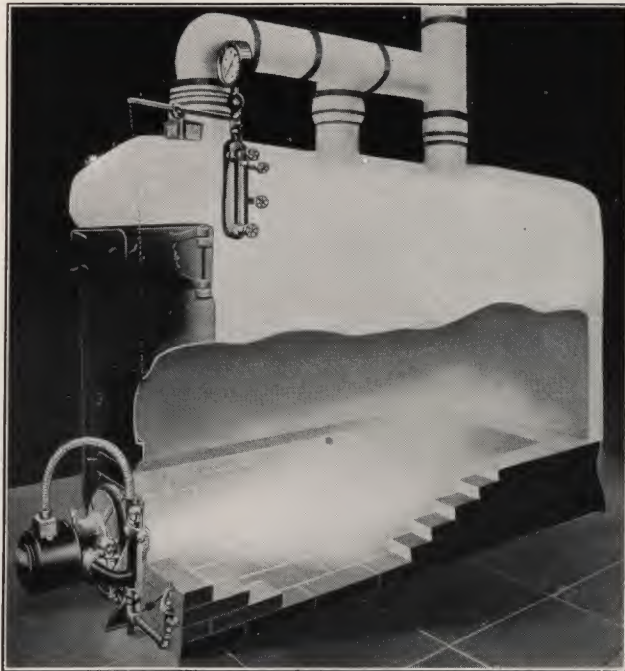
- (1) Mechanical draft A.C. motor driven burner. For domestic type installations are fully automatic. Commercial types are automatic or manual controlled as required.
- (2) Fess Holden Morgan Automatic Burners are listed to burn 28 gravity (A.O.B.A. Spec. #3) oil.
- (3) Oil is delivered automatically from storage tank to atomizing nozzle.
- (4) Atomization by low pressure air with externally atomizing type nozzle.
- (5) The ignition is fully automatic by electric spark. Gas ignition can be supplied if desired.
- (6) Flame adjustments are made to meet the requirements of the boiler or furnace.
- (7) Fess Holden Morgan Automatic Burners are installed in the firing door of the boiler or furnace. A refractory hearth is built on top of coal burning grates.
- (8) Radiation capacity: Model D-1 is suitable for installations having from 350 to 3,600 square feet of steam radiation; Model D-3 for 840 to 5,400 square feet; Model B-1 for 1,300 to 9,600 square feet.
- (9) Motor sizes:

Model D-1	⅓ H.P.
" D-3	½ H.P.
" B-1	¾ H.P.

FESS OIL BURNERS OF CANADA, LIMITED

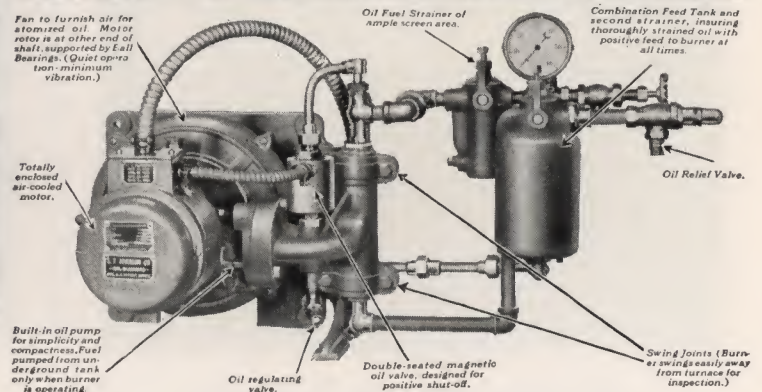
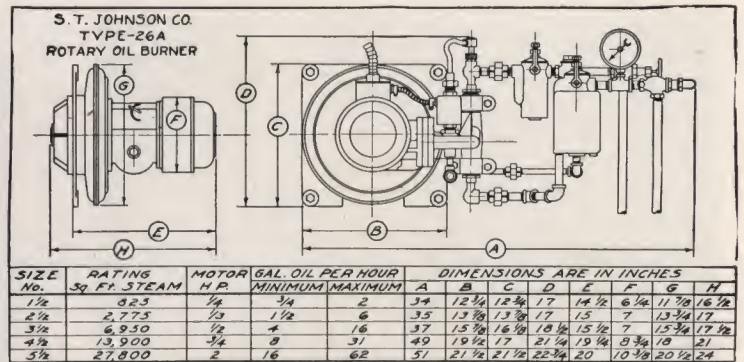
514 King Street East - - - Toronto 2, Canada

JOHNSON OIL BURNERS



Above—Johnson Burner Installed

At right—Full Automatic Johnson Burner



S. T. Johnson Co. Oil Burners, Automatic Type, are installed in all types of residential heating plants. Johnson Burners, Industrial Type, are installed in all types of low or high pressure heating systems, power plants, furnaces, ovens or kilns.

- (1) Mechanical draft A.C. or D.C. motor driven burner. For residential purposes are fully automatic; for commercial or industrial purposes are automatic, semi-automatic or manually controlled as desired.
- (2) Johnson Burners, Automatic Type, are listed to burn 28 gravity oil (A.O.B.A. Spec. #3) or lighter—also Pacific Coast 24 gravity Diesel oil. Johnson Burners, Commercial and Industrial Type, burn 14 gravity oil or lighter.
- (3) Oil is delivered automatically by pump from storage tank to atomizing cup.
- (4) Atomization of the oil is accomplished mechanically by motor driven rotary cup.
- (5) The ignition system is fully automatic—expanding gas pilot.
- (6) Flame adjustments are made to meet the requirements of the boiler or furnace.
- (7) Johnson Burners, Automatic Type, are installed in the present heating systems requiring only the

removal of the coal burning grates and lining of combustion chamber with refractory material.

- (8) Johnson Manual Control and Full Automatic Oil Burners are made in five sizes and three styles, covering a range of 250 to 27,800 square feet of steam radiation or its equivalent. Capacities as given below are catalogue ratings:

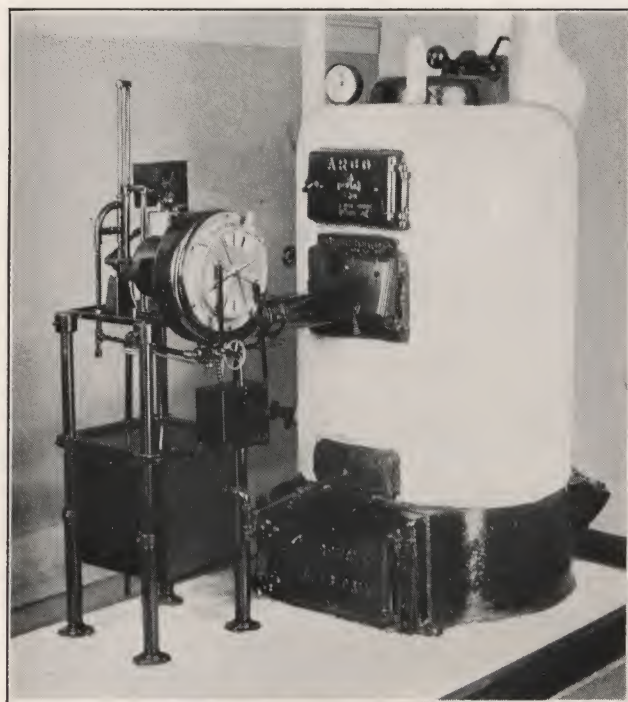
Type	No.	Sq. Ft. Steam	Sq. Ft. Radiation
B Junior		250	750
22 or 26A	1 1/2	300	825
22 or 26A	2 1/2	700	2,775
22 or 26A	3 1/2	1,750	6,950
22 or 26A	4 1/2	3,500	13,900
22 or 26A	5 1/2	7,000	27,800

- (9) Motor size:

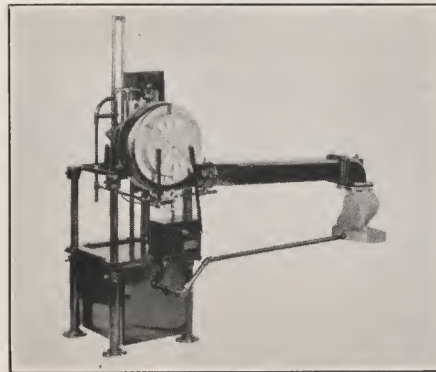
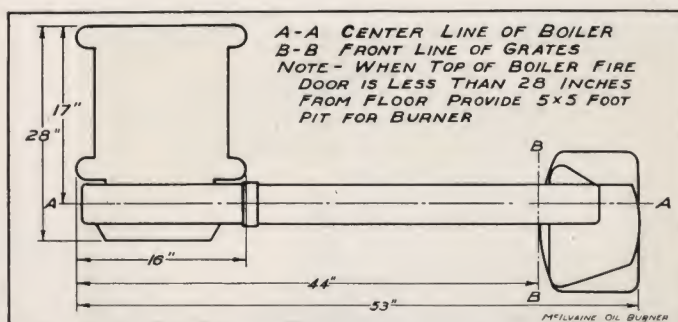
Type	No.	Motor H.P.
B Junior		1/2
22 or 26A	1 1/2	1/4
22 or 26A	2 1/2	3/8
22 or 26A	3 1/2	1/2
22 or 26A	4 1/2	3/4
22 or 26A	5 1/2	2

S. T. JOHNSON CO.

940 Arlington Avenue . . . Oakland, California



McIlvaine Burner Installed



McIlvaine Burner

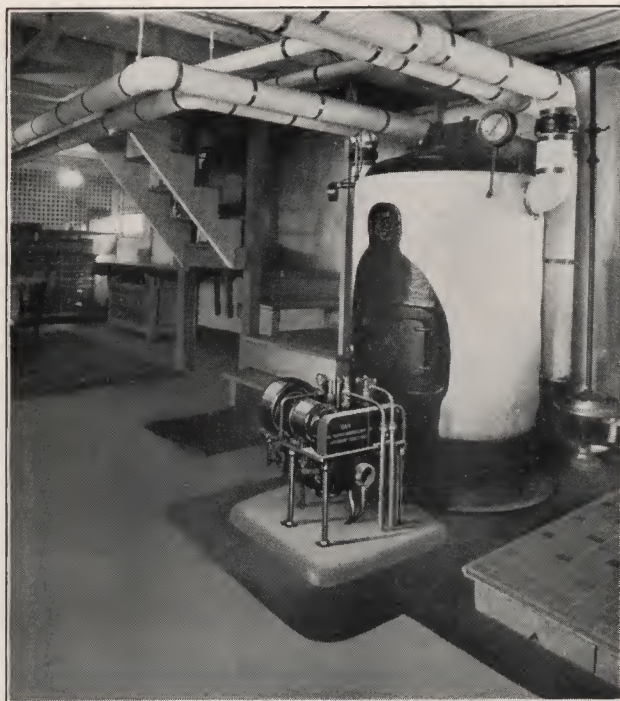
McIlvaine Oil Burners are installed in all types of residential heating plants and all styles of boilers, furnaces, or hot water heaters.

- (1) Operation is continuous with mechanical draft. The flame is gradually increased or decreased to meet demand for heat and may be automatically controlled from room temperature, boiler pressure or hot water temperature, or by remote manual control.
- (2) McIlvaine Oil Burners are listed to burn 36 gravity oil (A.O.B.A. Spec. # 1).
- (3) Oil feeds from elevated basement storage tank (or from underground storage tank through automatic pumping unit) by gravity through combination float and safety shut-off valve, centrifugal pump, and control valve to combustion chamber.
- (4) Oil is vaporized by contact with hot combustion chamber.
- (5) Ignition is manual by oil or gas torch.
- (6) Oil and air are automatically proportioned at seven operating stages through range of 1/12 to full capacity from low to high for each size burner.
- (7) Combustion chamber and air tube assembly is inserted through coal door and rests on grates, which are covered with asbestos paper and loose fire brick. Inspection door, brick and asbestos cement fill remainder of coal door opening.
- (8) Motor, pump, fan and control unit are made in one size, and combustion chambers in six sizes. These are numbered and have capacities in square feet of steam radiation including mains and risers (or the equivalent hot water or hot air load) as follows: No. 1—600 or less; No. 1½—600 to 800; No. 2—800 to 1,200; No. 3—1,200 to 1,600; No. 4—1,600 to 2,000; No. 5—2,000 to 2,400.
- (9) Motors are 1/20 H.P. for all sizes and consume from 40 to 80 watts depending on size and load.

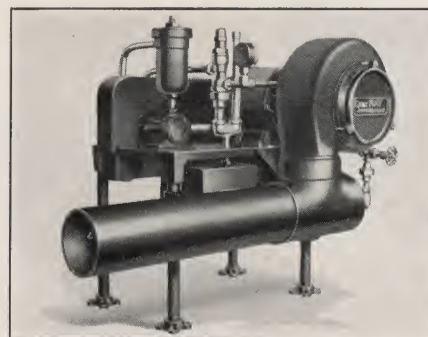
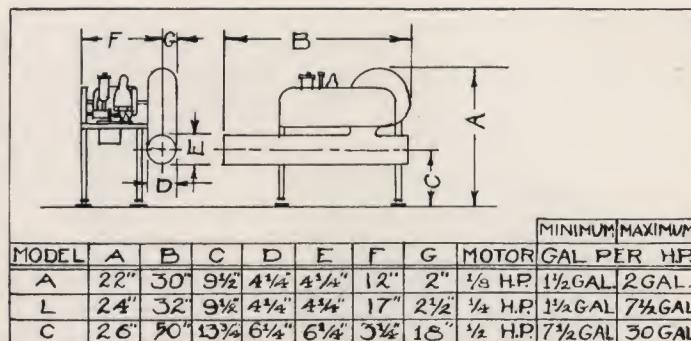
McILVAINE BURNER CORPORATION

749 Custer Avenue - - - Evanston, Illinois

QUIET MAY



Quiet May Burner Installed



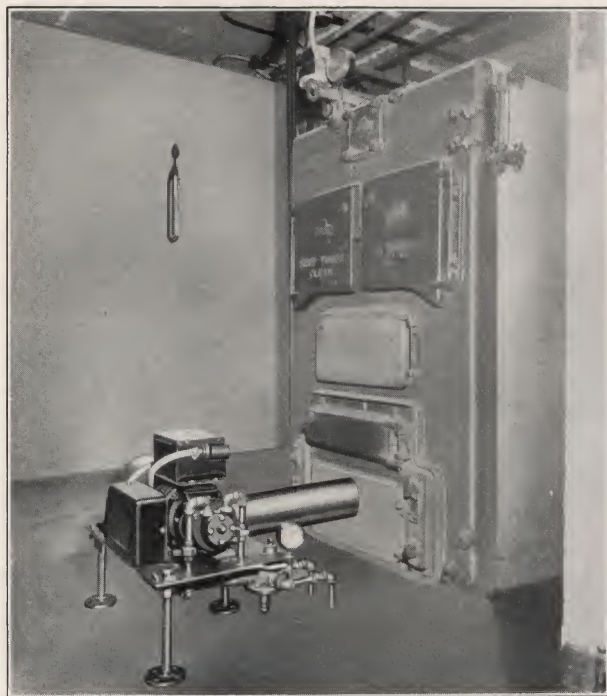
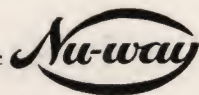
Quiet May Burner

The Quiet May Automatic Oil Burner is a fully automatic oil burner, suitable for either domestic or commercial operation, in steam, hot water, vapor or warm air heating plants.

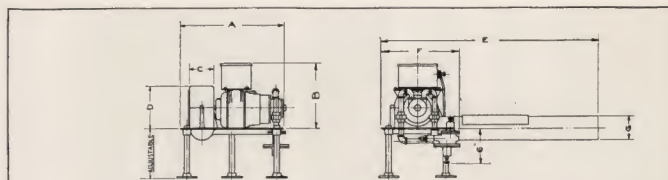
- (1) Mechanical draft burner A.C. and D.C. motor drive. Intermittent operation. Thermostat, boiler or manual control.
- (2) Listed to burn 28 gravity oil (A.O.B.A. Spec. #3) or 25 gravity Pacific coast Diesel oil.
- (3) Oil is brought from storage tank by suction pump on burner which delivers it under pressure to the atomizer.
- (4) Atomization is by specially designed mechanical pressure atomizer.
- (5) Ignition is electric spark.
- (6) Flame can be adjusted as to size and shape to meet requirements of boiler or furnace.
- (7) Only changes required are removal of grates and lining of combustion chamber with fire brick.
- (8) Made in three sizes—commercial and domestic, adaptable to small homes and to large apartment buildings.
- (9) Motor sizes:
 Model A—⅓ H.P.
 " L—½ H.P.
 " C—½ H.P.

MAY OIL BURNER CORPORATION

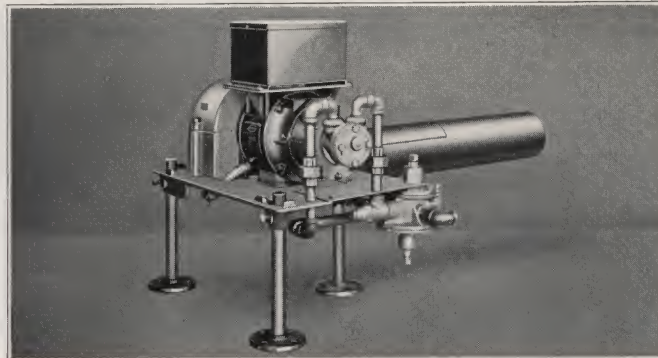
3500 East Biddle Street . . . Baltimore, Md.



Nu-Way Burner Installed



MODEL N°	A	B	C	D	E	F	G	MOTOR	GALLONS PER HOUR	
									MINIMUM-	MAXIMUM-
HP-25	16 1/2	11	4	6 3/4	36	12	4 1/2	1/8	1 1/2	3
HP-35	22	11 1/2	5 1/2	8	41	13	6	1/8	3	8
HP-55	24	13	6 1/2	10 1/4	44	14	6	3/4	8	25



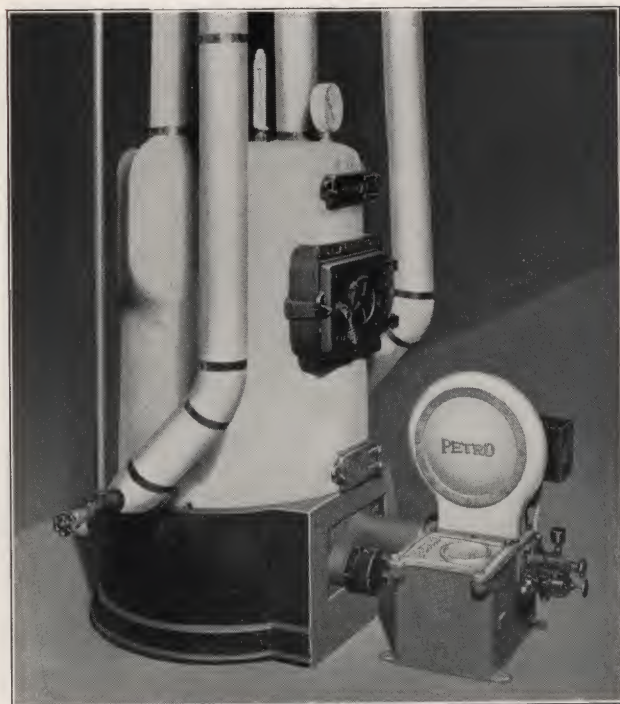
Nu-Way Burner

All sizes of Nu-Way Burners are available in full automatic, semi-automatic, or manually controlled. They are suitable for domestic water supply heating, all types of domestic heating plants and industrial heating.

- (1) Mechanical draft D.C. or A.C. (all frequencies) motor-driven burner. For domestic purposes all burners are fully automatic. For industrial purposes burners are controlled manually, semi-automatically or automatically according to requirements.
- (2) All Nu-Way Burners are listed to burn oil of 28 gravity (A.O.B.A. Spec. #3) or lighter.
- (3) Oil is delivered automatically from storage tank to nozzle by pump mounted on burner.
- (4) Atomizing process is accomplished by pressure through nozzle.
- (5) Ignition is automatic and intermittent. Combination electric and gas or straight electric ignition are standard.
- (6) Flame adjustments are made to meet the requirements of the heating plant.
- (7) Nu-way Burners can be installed in any type of heating plant. In coal or wood burning systems it is necessary only to remove the grates and line the combustion chamber with refractory material.
- (8) Nu-Way Burners are manufactured in three sizes and are suitable for heating plants having from 500 to 9,000 square feet of steam radiation or equivalent. Model 25 H.P. will heat from 500 to 1,000 square feet, 35 H.P. from 1,000 to 2,800 square feet, and 55 H.P. from 2,800 to 9,000 square feet of steam radiation or equivalent.
- (9) Motor sizes:
 Model 25 H.P. 1/8 H.P.—1,750 R.P.M.
 “ 35 H.P. 1/6 H.P.—1,150 R.P.M.
 “ 55 H.P. 3/4 H.P.—1,750 R.P.M.

THE NU-WAY CORPORATION

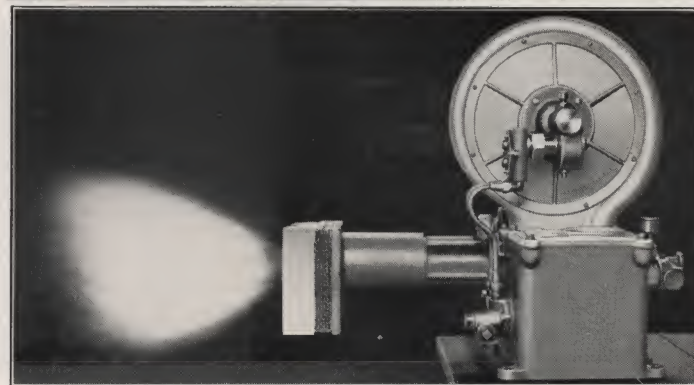
Rock Island . . . Illinois



Model LD-0 Petro Burner Installed

DIMENSIONS
ARE IN
INCHES

MODEL NO.	A	B	C	D	E	F	G	MOTOR	MINIMUM	MAXIMUM
									GAL. PER HOUR	
L-D-0	22	25	6.5	12.5	6.5	9	11	1/8 H.P.	1 GAL.	2 1/2 GAL.
L-D-1	24	28	7	13	7	7.5	11	1/6 H.P.	2 GAL.	5 GAL.
L-D-2	30	26	7	21	11	14	11	1/2 H.P.	5 GAL.	15 GAL.
L-D-3	31	43.5	8	25	14	17	10.5	1 H.P.	15 GAL.	42 GAL.



Model LD-1 Petro Burner

Petro Burners, Automatic Type, are installed in all types of residential heating plants. Petro Burners, Industrial Type, are installed in all types of low or high pressure heating systems, power plants, furnaces, ovens or kilns.

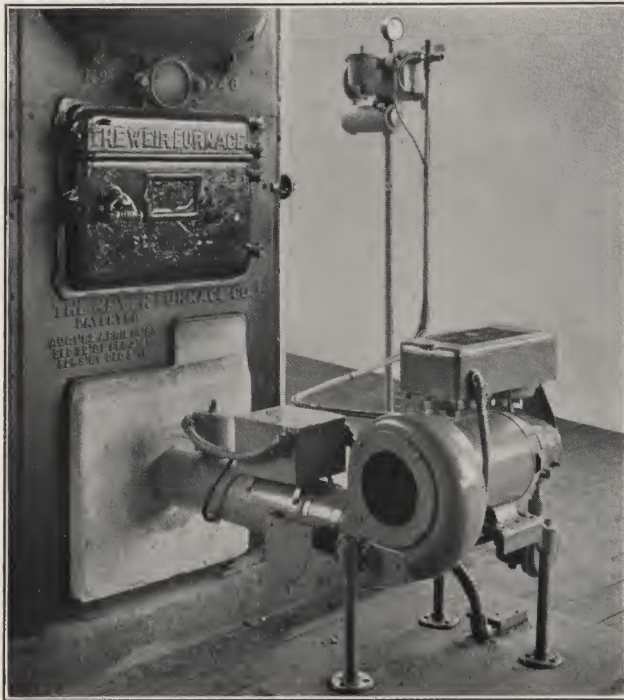
- (1) Mechanical draft A.C. or D.C. motor driven burner. For residential purposes are fully automatic; for commercial or industrial purposes are automatic, semi-automatic or manually controlled according to requirements.
- (2) Petro Burners, Automatic Type, are listed to burn 24 gravity oil (A.O.B.A. Spec. #4) or lighter. Petro Burners, Commercial and Industrial Type, burn 10 gravity oil or lighter.
- (3) Oil is delivered automatically from storage tank to atomizing cup.
- (4) Atomization of the oil is accomplished mechanically by air driven rotary cup.
- (5) The ignition system is fully automatic-combination of electric spark and gas. Also straight electric ignition.
- (6) Flame adjustments are made to meet the requirements of the boiler or furnace.
- (7) Petro Burners, Automatic Type, are installed in the present heating systems requiring only the removal of the coal burning grates and lining of combustion chamber with refractory material.
- (8) Petro Burners, Automatic Type, are manufactured in four sizes. Smallest burner, Model LD-0, has a range from 200 to 1,000 square feet of steam radiation including piping and risers, or equivalent. Model LD-1, from 800 to 2,000 square feet of steam radiation. Model LD-2 from 1,800 to 6,000 square feet of steam radiation. Model LD-3, from 5,000 to 18,000 square feet of steam radiation. Petro Burners, Industrial Type, are installed in boilers from 50 to 1,000 horse power.
- (9) Motor sizes:

Model LD-0	1/8 H. P.
" LD-1	1/6 H. P.
" LD-2	1/2 H. P.
" LD-3	1 H. P.

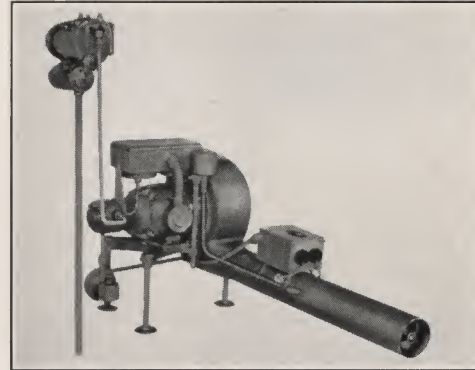
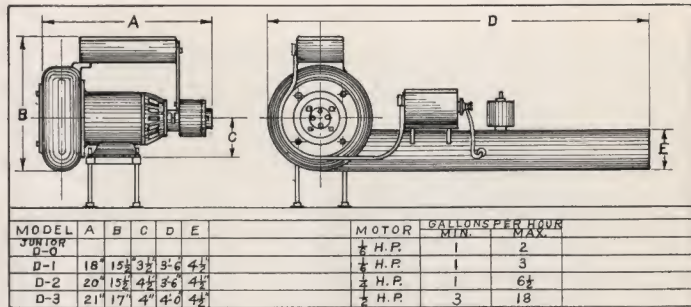
PETROLEUM HEAT AND POWER COMPANY

511 Fifth Avenue . . . New York, N. Y.

PREFERRED-HART



Preferred-Hart Burner Installed



Preferred-Hart Burner

Preferred-Hart Automatic Burners are installed in all types of residential, church, apartment and business building heating plants. Preferred-Hart D-O Junior is designed for installation in warm air furnaces and small boilers.

- (1) Mechanical draft motor driven burner, made for A.C. current of any cycle and for D.C. current, 110 volts and 220 volts. For heating residences of all sizes and for semi-industrial use. Burners are furnished for manual, semi-automatic and full automatic control, according to requirements.
- (2) Preferred-Hart Burners, automatic type, are listed to burn 28 gravity fuel and gas oil (A.O.B.A. Spec. # 3), and for 25 gravity Diesel (Pacific Coast Oil) when equipped with either gas-electric or straight electric ignition.
- (3) Oil is drawn through vacuum chamber by suction and lifted from vacuum chamber to the burner by suction, the necessary vacuum being produced by the atomizing pump.
- (4) Atomization of oil is accomplished by feeding the oil through an atomizing pump from which it is blown from the nozzle by the exhaust.
- (5) Ignition is fully automatic and is cut off after the oil ignites.
- (6) Flame adjustment is secured by varying both the oil and the air entering the furnace, and is adjusted to meet the requirements of the combustion chamber and heating plant.
- (7) Preferred-Hart automatic burners are readily installed in all types of heating equipment by lining the combustion chamber with the proper refractory material. The D-O (Junior) is installed through the firing door, without removing the grates.
- (8) Preferred-Hart Burners, both manual, semi-automatic, and fully automatic, are made in four sizes with a maximum capacity as follows:

D-O	350	square feet steam radiation
D-1	600	" " " "
D-2	2,000	" " " "
D-3	3,500	" " " "
D-3N	5,000	" " " "
- (9) Motor specifications are as follows:

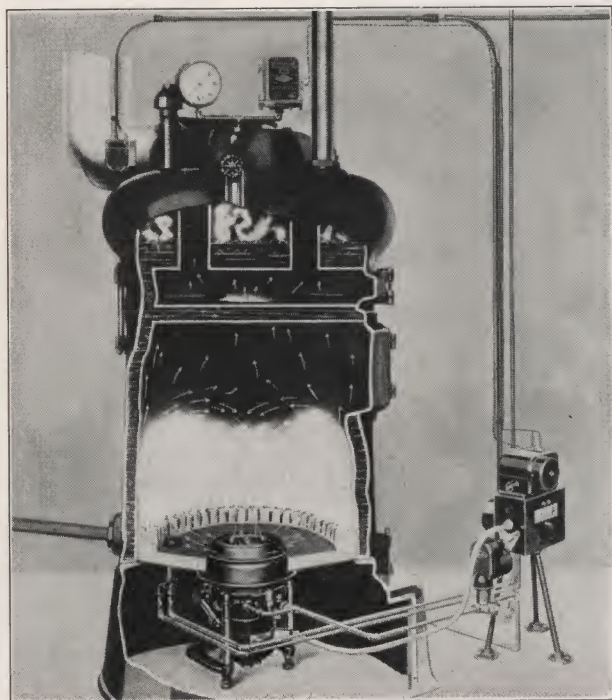
Model	H.P.
D-O (Junior)	1/6
D-1	1/6
D-2	1/4
D-3	1/2

All motors used are repulsion-induction type.

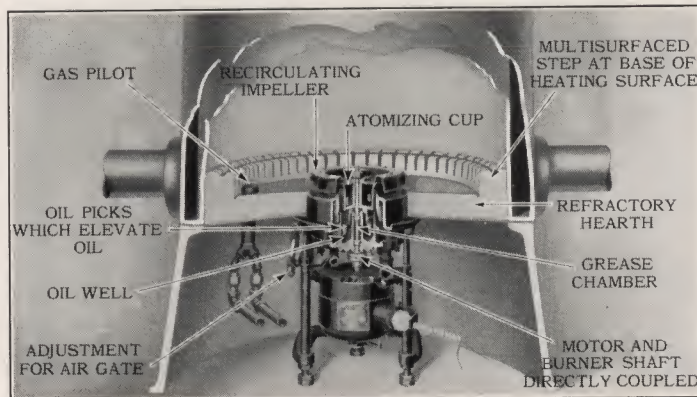
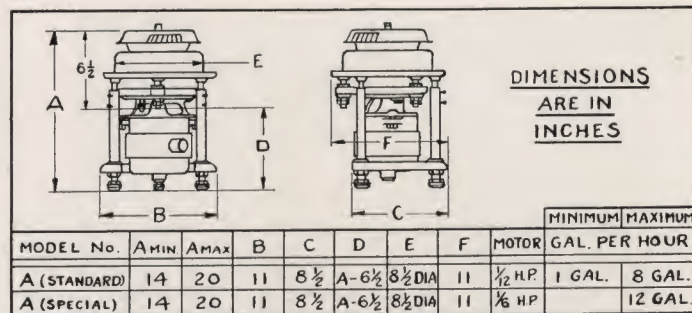
PREFERRED OIL BURNERS, INC.

2200 N. Adams - - - Peoria, Ill.

SILENT AUTOMATIC



Silent Automatic Oil Burner Installed



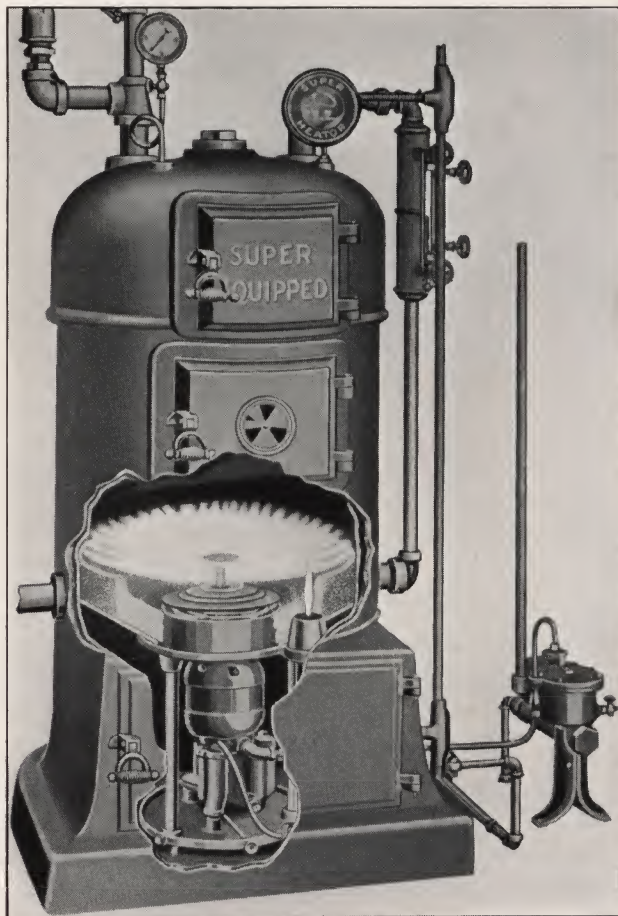
Silent Automatic Oil Burner

Silent Automatic is a rotary type burner that atomizes and vaporizes the oil.
It is made for domestic heating plants.

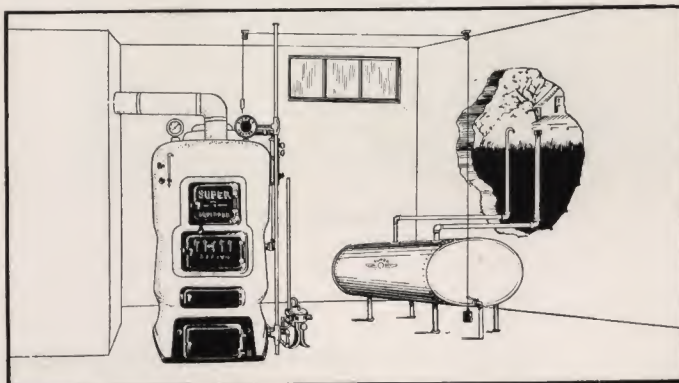
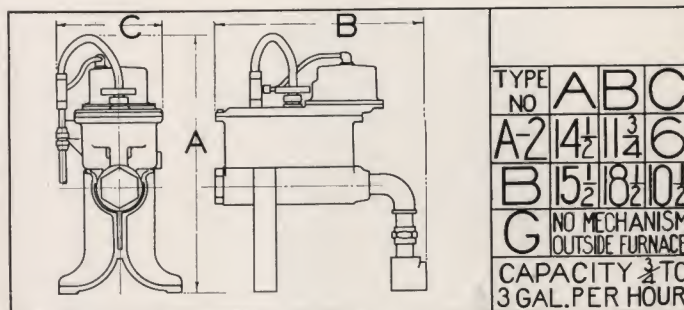
- (1) Can be applied to steam, vapor, hot water, or warm air heating plants.
- (2) Listed to burn 36 gravity oil (A.O.B.A. Spec. #2) or lighter.
- (3) Is fully automatic in operation.
- (4) Atomization of oil is accomplished by a combination of mechanical atomization and heat vaporization.
- (5) Ignition is by gas or electric pilot.
- (6) Oil and air adjustments provide for flame requirements of each individual installation.
- (7) Removal of the grates is the only change necessary for installation in heating plants.
- (8) Capacity of burner:
Standard Model 1 to 8 gallons per hour.
Special Model 8 to 12 gallons per hour.
- (9) Motor sizes:
Standard Model 1/12 H.P.
Special Model 1/6 H.P.

SILENT AUTOMATIC CORPORATION

255 Meldrum Avenue - - - Detroit, Mich.



Super Automatic Oil Heater Installed in Boiler



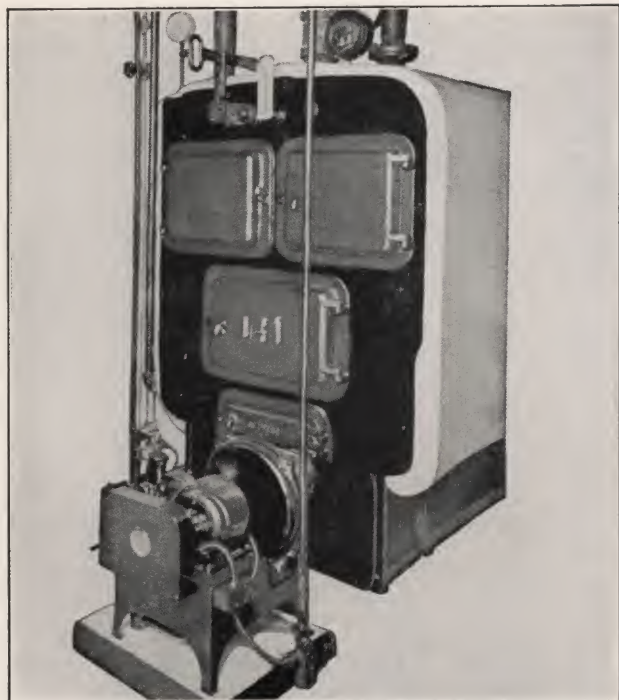
Type A2 Super Automatic Oil Heater

Super Automatic Oil Heaters are installed in all types of residential heating plants, and as hot water heaters for apartments or hotels.

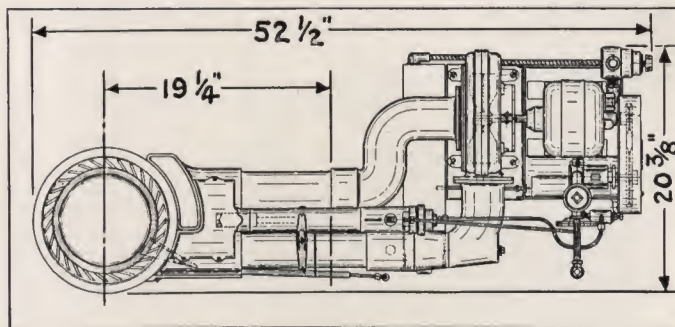
- (1) Mechanical draft A.C. or D.C. motor-driven burner. Fully automatic or manually controlled if desired.
- (2) The Super Automatic Oil Heater is listed to burn 32 gravity oil (A.O.B.A. Spec. #2) or lighter.
- (3) Oil is fed by gravity from the storage tank to the carburetor, from where it is taken by suction through the burner pump to the atomizing nozzle.
- (4) Atomization is by air pressure created by a spiral gear pump through which air and oil pass as a mixture.
- (5) Ignition is either by gas or electricity, and is fully automatic.
- (6) The flame of the Super Automatic Oil Heater is circular and may be used in sectional boilers as well as round. Adjustments of the flame are made to suit the boiler or furnace in which it is installed.
- (7) To install the Super Automatic Oil Heater it is only necessary to remove the grates and build a circular bowl shaped hearth of refractory material supported on a special frame furnished with the heater.
- (8) The Super Automatic Oil Heater is made in two sizes, one which runs at only 1,140 R.P.M., and the other at 1,725 R.P.M. The radiation capacities are 650 feet of steam, 800 feet of vapor, or 1,000 feet of hot water. The larger size will handle about 30% more radiation. The Super Oil Heater can be installed in any boiler with a fire pot 15 inches in diameter or larger.
- (9) Motor sizes are 1/6 and 1/4 horsepower repulsion induction motors.

THE SUPER OIL HEATER COMPANY

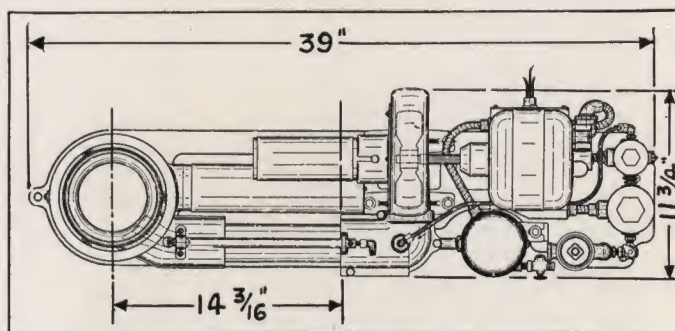
1027 Newport Avenue - - - Pawtucket, R. I.



Model "L" Sword Burner Installed



Model "L" Sword Burner



Model "J" Sword Burner

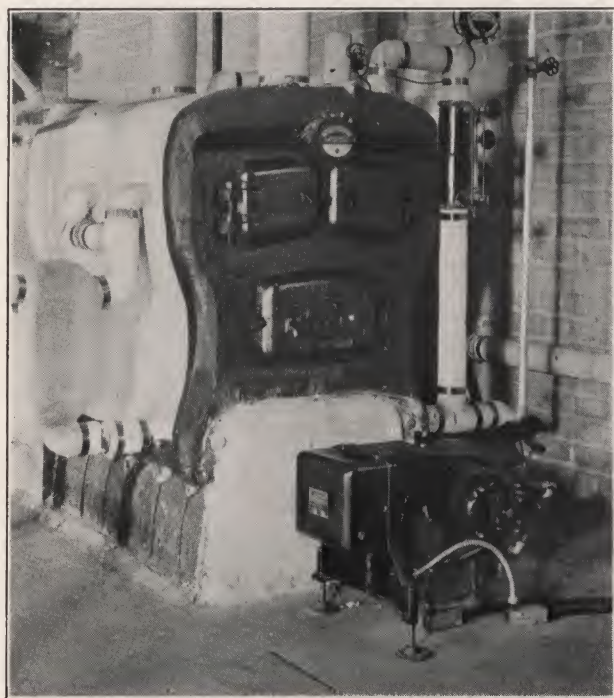
Sword Superheater Oil Burners are primarily designed for residences of all sizes.

- (1) Sword Burners are fully automatic, operated by 110 A.C. or D.C. motors. They may be applied to any steam, vapor, hot water or warm air furnace.
- (2) 36-40 gravity oil (A. O. B. A. Spec. # 1), 175 flash point or better is recommended for use with the burners.
- (3) Oil is pumped direct from tank to burner.
- (4) Oil is atomized by the mechanical process; air is preheated and is mixed with hot gases from the furnace.
- (5) Automatic, gas or electric ignition.
- (6) Flame is adjustable to requirements of furnace.
- (7) Ash doors and grate only are removed. No brick lining to fire box is necessary.
- (8) Model L Burner is for the larger type of home, and Model J Economy Burner for houses of 500 feet of radiation or less.
- (9) Motor sizes:

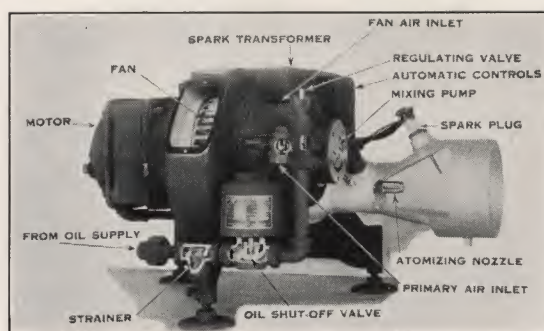
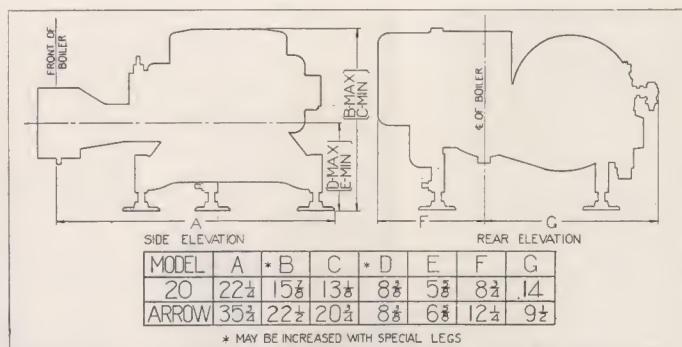
Model L	1/8 H.P.
Model J	1/8 H.P.

SWORD & KIMBER COMPANY

4861 Stenton Avenue . . . Philadelphia, Pa.



Timken Model 20 Burner Installed



Timken Model 20 Burner

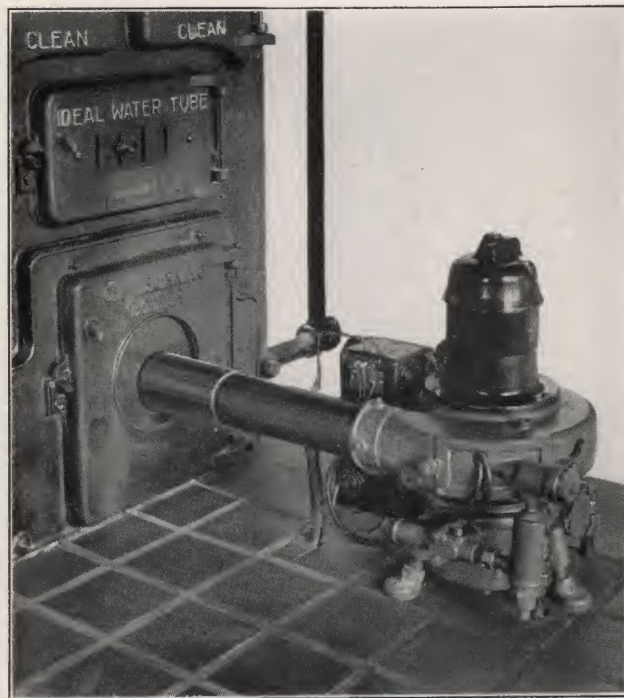
Timken Burners are fully automatic and suitable for all types of domestic installations.

- (1) Mechanical draft A.C. motor driven burner, for residential purposes. Fully automatic.
- (2) The Timken Model 20 Burner is listed to burn 28 gravity oil (A. O. B. A. Spec. #3) or lighter. The Timken-Arrow Burner is listed to burn 35 gravity oil or lighter.
- (3) Oil is delivered from storage tank to burner by suction (Arrow) or gravity (Model 20).
- (4) Atomization of the oil is accomplished mechanically.
- (5) Ignition is by electric spark and is fully automatic.
- (6) Flame adjustments are made to meet the requirements of the boiler or furnace.
- (7) In making installation, no changes are necessary in heating plant, except that grates are removed and unjacketed ash-pit walls are protected with fire brick.
- (8) Motor sizes:
 Model 20 1/6 H.P.
 Arrow 1/4 H.P.

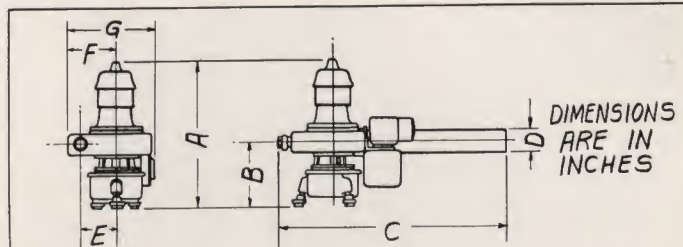
THE TIMKEN-DETROIT COMPANY

(Subsidiary of the Timken-Detroit Axle Co.)

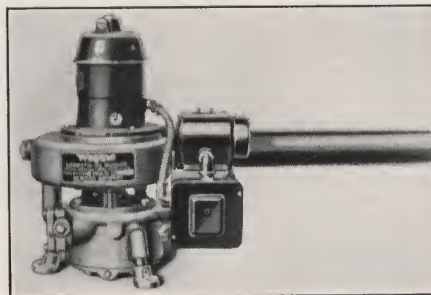
200 Clark Avenue . . . Detroit, Mich.



Wayne Burner Installed



TYPE	A	B	C	D	E	F	G	MOTOR	GAL. PER HR.	
									MIN.	MAX.
B-3	22	9 1/2	36	3 1/2	5 5/8	8	14	1/6 H.P.	2	4
B-4	27	14	36	4 1/4	6 5/8	9	16	1/4 H.P.	4	10
B-6	34	18 1/2	47	6 5/8	8 3/4	12	21	1/2 H.P.	10	25



Wayne Burner

Wayne Oil Burners are fully automatic, suitable for either domestic or commercial operation, in steam, hot water or warm air heating plants.

- (1) Wayne Oil Burners are mechanical draft A.C. or D.C. motor driven. For residential purposes they are fully automatic; for commercial or industrial purposes, automatic, semi-automatic or manually controlled, as required.
- (2) Wayne Burners are listed to burn 28 to 32 gravity oil (A. O. B. A. Spec. #3), or lighter, and 25 gravity Pacific coast Diesel oil.
- (3) Oil is delivered by positive pump pressure to atomizing nozzle at 100 lbs. pressure.
- (4) Atomization of the oil is accomplished by high pressure fixed nozzle tip.
- (5) The Ignition system is fully automatic intermittent electric spark.
- (6) Flame adjustments are made to meet boiler or furnace requirements.
- (7) Wayne Oil Burners are installed in present heating systems for steam, hot water, vapor or warm air. Only changes required are removal of grates and lining combustion chamber with refractory material.
- (8) Wayne Oil Burners are manufactured in three sizes:
W.B.-3 has a range up to 1,500 square feet steam radiation.
W.B.-4 has range from 1,500 to 3,500 square feet steam radiation.
W.B.-6 has range from 3,500 to 12,000 square feet steam radiation.
- (9) Motor sizes:
W.B.-3—1/6 H.P.
W.B.-4—1/4 H.P.
W.B.-6—1/2 H.P.

WAYNE COMPANY

Fort Wayne . . . Indiana

**DESCRIPTIONS
AND
ILLUSTRATIONS**

**of the Accessory Oil Heating Equipment
made by Manufacturers who are Mem-
bers of the Oil Heating Institute**

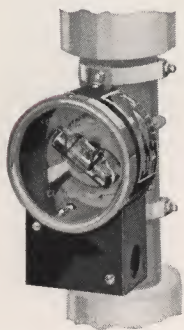


Complete Controls and Safety Systems for Domestic and Industrial Oil Burners. Thermoswitches—Boiler Controls—Stackswitches—Magnetic Valves—Strainers—Low Water Protection.

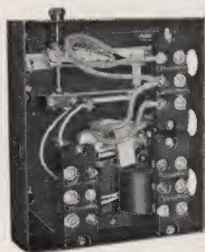


Also other Thermoswitches for industrial applications.

Con-Tac-Tor Thermoswitches are made in two wire and three wire types and in either plain or clock models. Used to control Oil Burners from variations of room temperatures. Adjustable for ranges from 58-82° F.

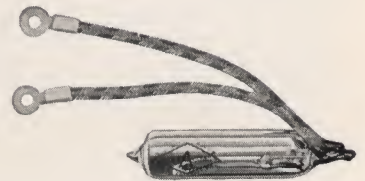


Con-Tac-Tor Boiler and Furnace Controls are also furnished for high voltage and low voltage control systems and operate from boiler or furnace conditions. Made for hot water, steam, vapor, vacuum and warm air heating systems. Can be used either as operating controls or as safety devices.



Con-Tac-Tor Complete Automatic control systems known as the No. 77 Lockswitch System and the No. 123i Burner Boss System which govern starting, running and safety operation of either domestic or industrial oil burners. Completely approved systems protecting oil burner operation. Incorporate Con-Tac-Tor (Mercury Switch) switching units.

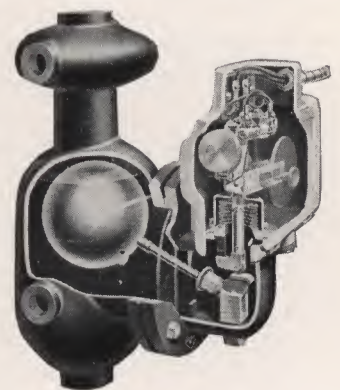
Con-Tac-Tors (Mercury Switches) are made in a number of standard types and sizes, for various types of switch applications. Also made in various electrical ranges from 1 to 40 amperes. Con-Tac-Tors are unaffected by dirt, dust, moisture or corrosion.



Con-Tac-Tor Stackswitches are monitor instruments governing the sequence and timing of complete control systems. Furnished in two wire or three wire types or for manual reset operation. Incorporate Con-Tac-Tors for high voltage switching.



The Duplex Switch and Low Water Cut-Off provide safety shutdown for oil burners operating in steam and hot water systems to prevent firing into a dry boiler. The Duplex Switch includes pressure control in addition to low water protection. Made in high or low voltage types incorporating Con-Tac-Tor Mercury Switches.



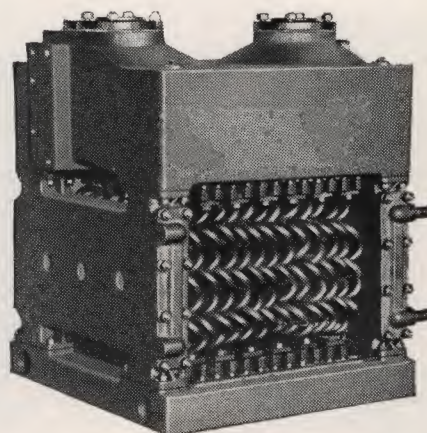
ABSOLUTE CON-TAC-TOR CORPORATION

ELKHART . . . INDIANA

BRYAN



The Bryan Oil Burning Boiler



Tube Assembly

The Bryan Oil Burning Boiler is designed especially to meet the specific boiler requirements of oil burning and will operate with any good oil burner, in steam, hot water, vapor or vacuum heating systems.

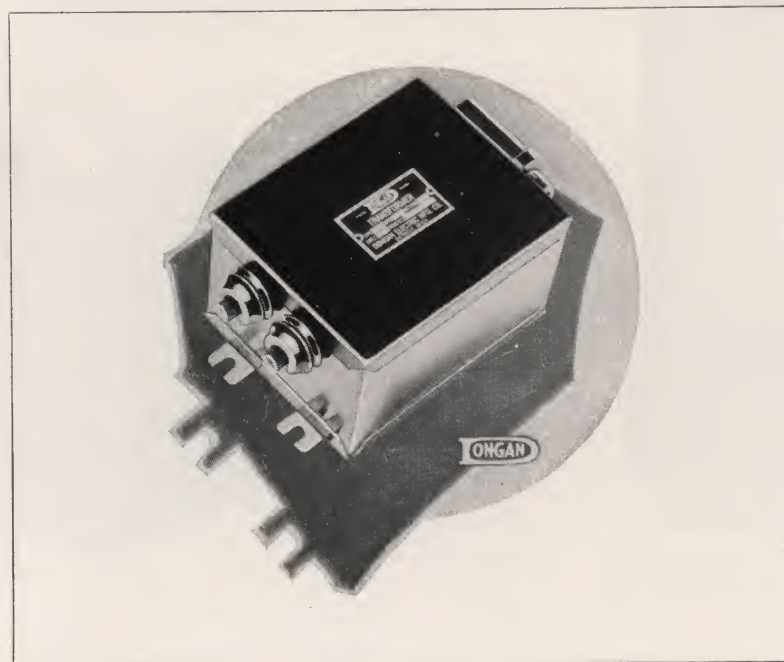
- (1) Built in accordance with the American Society of Mechanical Engineers Code for construction of low pressure boilers.
- (2) Tubular boiler using seamless removable sectional copper tubing.
- (3) Built in 4 sizes, from 500 square feet of steam radiation to 1,600 square feet of steam radiation, and from 800 square feet to 2,500 square feet of hot water radiation.
- (4) Designed with special coil built into the boiler to supply hot water for domestic purposes.
- (5) Has especially designed combustion chamber for oil burning.

THE BRYAN STEAM CORPORATION

Boiler Division

Peru

Indiana



Dongan Ignition Transformers

are applicable wherever electric ignition is used, either directly or in conjunction with gas.

Dongan Condensers

are suitable for Oil Burner requirements.

DONGAN ELECTRIC MANUFACTURING CO.

Franklin at McDougall . . . Detroit, Mich.



Figure 15

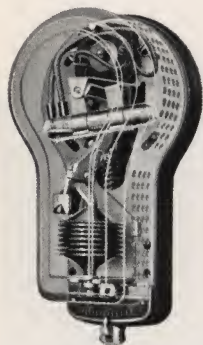


Figure 21



Figure 36



Type L



Type SA

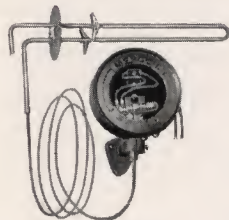


Figure 50

THE MERCROID CORPORATION manufacture a complete line of controls, listed as standard by the Underwriters' Laboratories, designed to meet the requirements of the heating industry.

A brief description is given below of some items. Complete information on any devices may be had upon request.

MERCROID SWITCH

(Figure 15)

This switch meets most operating conditions. Has a rating of 1 ampere at 110 volts.

MERCROID SWITCH

(Figure 3)

Has Standard Rating of 10 amperes at 110 volts or 5 amperes at 220 volts, either A.C. or D.C., with ample capacity for higher starting loads.

THE MERCROID THERMOSTAT

(Figure 21)

Designed to automatically control an electric circuit through changes in air temperature.

MERCROID IMMERSION TYPE CONTROL

(Figure 36)

Automatic limiting device for control of motor-driven units on hot water boilers.

MERCROID VISAFLAME

(Type L)

An automatic safety control which permits burner to operate only in the presence of actual visible light from the flame.

MERCROID PYRATHERM

(Type SA)

Designed for flue operation. Can be used for both high and low temperature conditions. Insures protection against dangers resulting from flame or ignition failure.

MERCROID FURNACE CONTROL

(Figure 50)

Designed to prevent overheating in warm air furnaces equipped with motor-driven units.

DOUBLE ADJUSTMENT MERCROID CONTROL

(Model G-1)

For temperature control of hot water boilers and storage tanks. Has many applications in industrial work.

MERCROID RISERTHERM

(Figure 35)

Surface type control to be clamped on risers of hot water heating systems or to hot water tanks. Has simple interchangeable mounting arrangement.

MERCROID PRESSURE CONTROL

(Figure 31)

For all steam units having automatic oil burner and automatic coal-burning equipment.

MERCROID ADJUSTATHERM

(Type S)

For safety trip-off operation in connection with Mercoid Type L Visaflame.

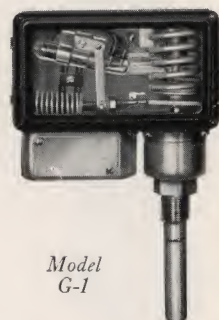
MERCROID COMBINATION CONTROL

(Figure 71)

For low water and pressure; to protect automatically fired steam boilers. Prevents the hazard of firing into dry boilers or building up excess pressure.



Figure 3



Model G-1

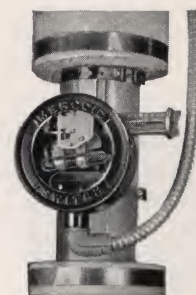


Figure 35



Figure 31



Type S

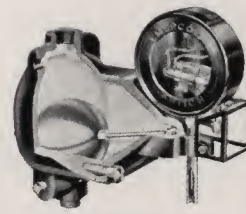


Figure 71

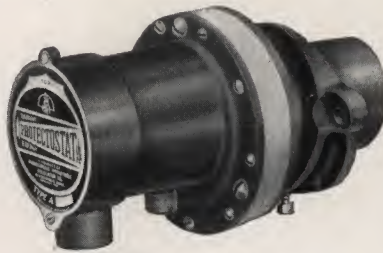
THE MERCROID CORPORATION

564 W. Adams St. - - - Chicago, Ill.

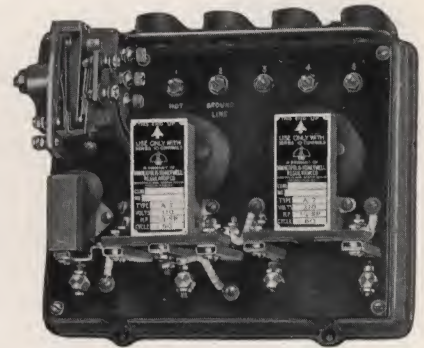
A Complete Line of Controls for Oil Heating Equipment



8-day, 7-jewel
Clock Thermostat



Protectostat



Protectorelay



DSS Motor Switch

Thermostats are made both plain and clock type. Are for use in connection with low voltage control circuits.

Boiler and Furnace Controls are made for all types of heating systems in connection with low voltage control circuits.

Complete Control System, with a program motor switch or relay panel can be arranged to meet the needs of any burner.

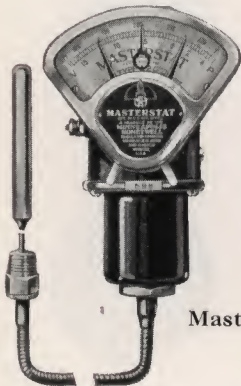
Relays are available for all types of burners and can be used to control the cycle of operation if desired.

Stack Safety Controls are applicable to any low voltage control system.

Protectostat. A safety device operated by radiant heat. Is used in place of a stack safety control or similar device.



Plain Thermostat



Masterstat



Combustion
Control

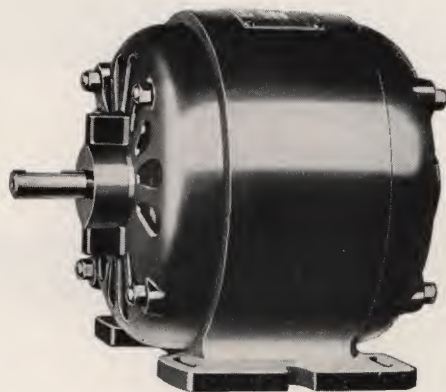
The Minneapolis-Honeywell Company manufacture a complete line of controls suitable for use with Oil Heating equipment in all types of heating systems.

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

Minneapolis, Minn.

Wabash, Indiana

OHIO MOTORS



Ohio Fractional Horse Power Motors are made in sizes from 1/20 to 1/4 Horse Power for A.C. and D.C. power circuits.

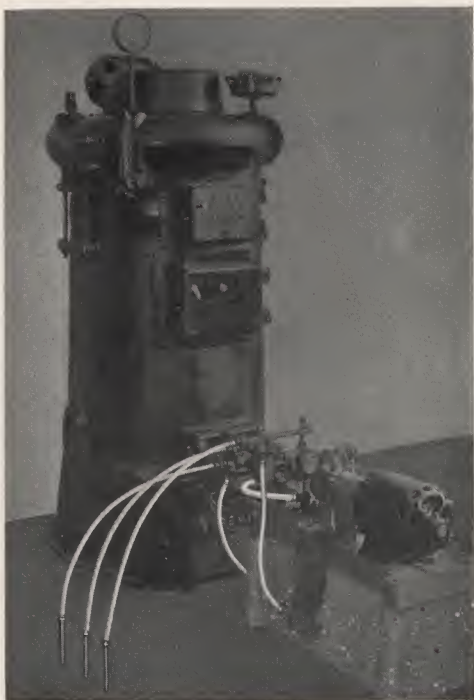
Ohio Motors satisfy the power companies requirements as to efficiency, power and starting current.

For *Horizontal* operation, in oil burner service, the Ohio Sleeve Bearing Motor is recommended and for *Vertical* operation, the Ohio Sleeve Bearing Motor with special Thrust Bearing.

Special Motors: If a special winding, frame, shaft extension, length of lead, switch or other special feature is required, Ohio Motors with one or more of these features can be supplied.

THE OHIO ELECTRIC & CONTROLLER COMPANY

5900 Maurice Avenue Cleveland, Ohio



Titeflex Application



Cross Section



Type O. B. Assembly



Titeflex with Soldered Fittings

Titeflex All-Metal flexible tubing is used on gas, oil and air lines, to absorb vibration, to allow for any movement between fixed units, to make for ease of installation, to absorb contraction and expansion of solid pipe, and to eliminate exact pipe fittings on Oil Burners.

- (1) Type O. B. listed as standard by Underwriters' Laboratories.
- (2) Type O. B. can be supplied with $\frac{1}{4}$ ", $\frac{3}{8}$ ", or $\frac{1}{2}$ " pipe fittings.
- (3) Type O. B. can be supplied in an over-all length 12" to 24" between couplings.
- (4) Titeflex can be supplied with soldered pipe threaded couplings in any over-all length.
- (5) Titeflex can be supplied with soldered couplings in all pipe sizes $\frac{1}{8}$ " to $2\frac{1}{2}$ " with corresponding male, female or union fittings.

TITEFLEX METAL HOSE CO.

500 Frelinghuysen Avenue . . . Newark, N. J.

Oil Company Members of Oil Heating Institute

BARNSDALL CORPORATION.....Petroleum Building, Tulsa, Oklahoma

CITIES SERVICE REFINING COMPANY.....209 Washington Street, Boston, Mass.

CREW LEVICK COMPANY.....219 North Broad Street, Philadelphia, Pa.

EMPIRE REFINERIES, INC.....Tulsa, Oklahoma

CONTINENTAL OIL COMPANY.....Denver, Colorado

GULF REFINING COMPANY.....Frick Building Annex, Pittsburgh, Pa.

PAN AMERICAN PETROLEUM & TRANSPORT COMPANY..120 Broadway, New York, N. Y.

MEXICAN PETROLEUM CORPORATION.....120 Broadway, New York, N. Y.

PURE OIL COMPANY.....35 E. Wacker Drive, Chicago, Ill.

SHAFFER OIL & REFINING COMPANY.....300 West Adams Street, Chicago, Ill.

~~SHELL UNION COMPANY OF CALIFORNIA.....200 Bush Street, San Francisco, Cal.~~

STANDARD OIL COMPANY OF NEW JERSEY.....26 Broadway, New York, N. Y.

STANDARD OIL COMPANY OF NEW YORK.....26 Broadway, New York, N. Y.

SUN OIL COMPANY.....Financial Building, Philadelphia, Pa.

TIDE WATER OIL COMPANY.....11 Broadway, New York, N. Y.

ASSOCIATED OIL COMPANY.....79 New Montgomery Street, San Francisco, Cal.

THE OIL HEATING INSTITUTE has also published the following booklets, each containing valuable facts about oil heat:

Are Oil Heaters Perfected?

Does It Pay to Install an Oil Heater?

Making Better Use of the Basement.

What About the Supply of Fuel Oil?

Copies of these booklets will be sent to you on request.

OIL HEATING INSTITUTE

420 MADISON AVENUE
NEW YORK CITY

